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COLLECTIVE REVIEW

CONGENITAL MALFORMATIONS OF THE NECK

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HISTORIC

According to V. A. Funk (8), to Ascheron, in 1832, must be given the credit of first discovering that congenital cysts and sinuses of the neck had a definite connection with aberrations of fœtal branchial clefts. Somewhat later Roser and Koenig reinvestigated the same subject and confirmed Ascheron's findings. Lilienthal (11) and DaCosta (22) credit Mayer, in 1833, with the first comprehensive report on carotid body tumors, although Luschka, in 1862, so popularized the subject that this body is now very generally known as Luschka's gland. After a most careful perusal of the literature, the reviewer has failed to find the original authors who first classified cystic hygromas, lymphatic cysts, hæmorrhagic cysts or teratomata of the neck among tumors of congenital origin. Exact knowledge of these malformations appears to have been acquired through a slow process of medical evolution. Giacomo (32) believes that Wegner should be given credit for describing cystic hygromata of the neck in 1877.

FREQUENCE

Burke (7) makes the statement that thyroglossal cysts occur with comparative frequency, Dowd (51), in looking over the records of the New York Surgical Society, found no report of a complete branchiogenic fistula, thus indicating its comparative rarity. The records of the Cook County Hospital of Chicago, from 1909 to 1916, reveal 8 cases classified under the heading of "congenital malformations of the neck." A careful analysis of these 8 cases compelled the reviewer to reject 6 of them, the clinical history, operative findings, and lack of pathological report, all speaking against their embryologic derivation. One case, a doubtful branchial cyst, was a "fluctuating circumscribed swelling, the size of an almond, lying subcutaneously over the center of the right sternomastoid muscle." At operation the tumor was found within the sheath of the muscle; but there is no mention of any obliterated duct proximal or distal to the tumor, and no pathologic report is attached to the case history. The eighth case was an undoubted thyroglossal cyst. McKenty (13), reviewing the records of the Royal Victoria Hospital for ten years (1904 to 1914) was more fortunate, being able to tabulate 15 branchiogenic cysts, 5 branchiogenic carcinomata, 9 thyroglossal cysts, and 1 carotid body tumor—a total of 30 cases. Collison and MacKenty (9) were able to collect 60 cases of carotid body tumors in the literature up to 1913. Of these 60 cases, 4 had merely been accidentally found at autopsy and 2 had been examined postmortem, the nature of the growth not having been recognized ante-mortem. Dowd, up to 1913, collected reports on 91 cases of cystic hygroma of the neck, and only 35 cases involving the axilla or pectoral regions.

From a careful analysis of cases reported to date, it becomes self-evident that, in general, the diagnosis of congenital malformation was only arrived at after the operation. In the case of congenital cysts, only a microscopic examination of the epithelial or endothelial lining of the cyst-

wall will reveal the true nature of the tumor. Clinically, a definite diagnosis of congenital fistula can only be made when it is either complete, i.e., extending from the pharyngeal wall or foramen cæcum to the lateral or anterior surface of the neck, or of the incomplete internal or incomplete external types, i.e., opening either on the surface of the neck or in some portion of the pharynx. A pre-operative differential diagnosis between a true branchial or thyroglossal cyst (closed at both ends) and a hygroma cysticum colli, would appear to be impossible.

CLASSIFICATION

The classification of embryologic malformations has never been placed on a firm basis. Each author has apparently been content to work out his own "scheme," with little or no regard to previous publications. Thus, O. C. Smith (6), in his otherwise splendid classification of tumors of the neck, includes angiomata, hygromata, and dermoids of the neck under neoplasms and not among embryologic malformations; Murphy (2) classes the above under the proper heading but includes carotid body tumors among "malignant diseases" of the neck. He also classes hygromata as bursal cysts. Smith classifies carotid body tumors under the heading "tumors of special organs." Branchiogenic cysts are classified by the same author under two heads, (1) congenital (2) malignant, which is needlessly confusing. Kirmisson (14) divides all congenital cysts of the neck into (1) serous, (2) dermoid, (3) mucoid. His serous cysts are evidently hygromata, for he describes them as "large, multilobulated, extending from the lower jaw to the clavicle and from the median line almost to the spinous processes of the vertebræ." There may be as many as 100 pockets in one tumor. These tumors have a tendency to penetrate muscles (pseudo-malignant); they may even pass under the clavicle and form axillary cysts, or under the manubrium to the anterior mediastinum. He considers the etiology of serous cysts under two headings: (1) venous, because of their frequent intimate connection with the interior jugular vein and the clinical fact that the contents of the cyst is frequently bloody; (2) lymphatic, because of the dilatation of surrounding lymph channels. Dowd (10), writing on the subject of cystic hygromata of the neck, states that three types of growths have been included in some of the descriptions (in medical literature): (1) cystic tumors which have endothelial linings and which grow with much power through the tissues of the neck or downward under the clavicle into the axilla or pectoral region; (2) lymphangiomata; and (3) branchial cysts. He correctly maintains that only those of the first type should be called hygromas.

The following classification, based on embryologic, microscopic, and clinical data, has been compiled from the case reports to date.

1. Branchiogenic:
   - (*a*) Complete fistula (branchial fistula of Roser), patent both ends.
   - (*b*) Incomplete fistula (Cystic fistula) { Internal / External
   - (*c*) Branchial cyst, closed both ends, open in intermediate portion.
2. Thyroglossal
   - (*a*) Complete fistula (extremely rare).
   - (*b*) Incomplete internal (rare).
   - (*c*) Incomplete external (rare).
   - (*d*) Thyroglossal cyst (usual type).
3. Aberrant thyroid gland.
4. Supernumerary thyroid.
5. Lymphangioma (lymphangioma simplex and cavernosum).
6. Hæmorrhagic cysts (hemangioma congenitum).
7. Hygroma (hygroma cysticum colli congenitum).
8. Dermoid cysts (in parotid gland, near floor of mouth, in thyrohyoid or submaxillary region), Kirmisson (14).
9. Carotid body tumors { (*a*) Primary, benign. (*b*) Secondary, malignant.

EMBRYOLOGY

1. Branchiogenic fistula or cyst. In the development of the anterior part of the digestive tract, there are formed bilaterally symmetrical lateral diverticula which, pressing aside the lateral mesoderm of the head, come into apposition with corresponding invaginations of the ectoderm. The endodermal diverticula are termed pharyngeal pouches, while the ectodermal invaginations are known simply as branchial grooves. By pressing aside the mesoderm, the ectoderm and the endoderm for a time come in contact and fuse, forming the epithelial closing membrane, which breaks through in all forms that have a branchial respiration. The branchial grooves and pharyngeal pouches thus become continuous and together form the branchial clefts. Under normal conditions this fusion and breaking through does not occur in mammals. Between the branchial clefts are the branchial or visceral arches, each of which contains a skeletal rod, the cartilaginous branchial arch, its muscula-

ture, an aortic arch, and a nerve-trunk. The branchial arches are named in succession the mandibular, hyoid, and branchial arches proper. The first branchial cleft is also known as the hyomandibular cleft (Keibel and Mall, 57).

In a four-week-old human fœtus there are four branchial clefts which correspond to the gills in the fish. All these clefts should become completely obliterated or, in other words, the arches or bars separating the clefts should coalesce (with the exception of the first cleft which forms, practically speaking, the canals opening into the pharynx), leaving the neck perfectly smooth. The auditory canal develops at the site of the first cleft (52, 53). The eustachian tube, the middle ear, and the external auditory meatus would really form a complete fistula but for the membrana tympani which represents the thinnest portion of the cleft and contains two layers of epithelium, one from the ectoderm and one from the endoderm. This "near" fistula is really very similar to the real fistulæ which sometimes exist in the neck at the site of the second cleft. When maldevelopment of the first cleft occurs, it is apt to show itself by tabs in front of the ear or defects of the ear itself, and occasionally is associated with defective formation of the mouth (Dowd, 10). If nature fails in any of these particulars, there is produced a congenital fistula, a cyst, or both (Funk, 8).

The region that corresponds to the outer opening of the second branchial cleft is to be found at the anterior border of the sternomastoid muscle. The second pharyngeal pouch corresponds to the tonsillar depression; the openings of the third branchial cleft (pharyngobranchialis) are to be looked for near the larynx. A fistula of the second branchial cleft must lie, if the development of the vessels be normal, between the external and internal carotids and anterior to the glossopharyngeal and vagus nerves; a fistula of the third cleft, between the common carotid and vagus, as well as between the glossopharyngeal and superior laryngeal nerves, while a fistula of the fourth cleft must bend around the subclavian on the right and the arch of the aorta on the left, since these are derivations of the fourth aortic arch. So far, only fistulæ of the second branchial cleft have been recognized with perfect certainty (57).

2, 3, 4. Thyroglossal fistulæ or cysts; aberrant or supernumerary thyroids. Almost contemporaneously with the formation of the first pharyngeal pouch there appears the anlage of the thyroid gland. This anlage is recognizable before the first pharyngeal pouch has come into contact

Fig. 1. Incomplete internal brachial cyst and fistula. (De Tarnowsky collection.)

with the ectoderm, as a prominence in the ventral wall of the pharynx. It then becomes constricted to form a stalked vesicle, and its stalk, whose lumen becomes obliterated, persists for some time as an epithelial cord. The hollow stalk of the vesicle is the thyroglossal duct (57).

In a human fœtus of five weeks, we find this small vesicle on the back of the tongue. By the eighth week the first trace of glandular tissue appears. This is the developing thyroid gland which begins to secrete as early as the fourth fœtal month. The gland slowly passes down to its normal resting place through the thyroglossal duct, and this passage is obliterated behind it. Normally, nothing remains of this duct except the foramen cæcum, but when nature fails to do her duty a congenital abnormality is developed. If some of the thyroid cells are dislodged from the gland and remain along the duct, these may develop into accessory thyroids. The thyroglossal duct may fail to be obliterated, either partially

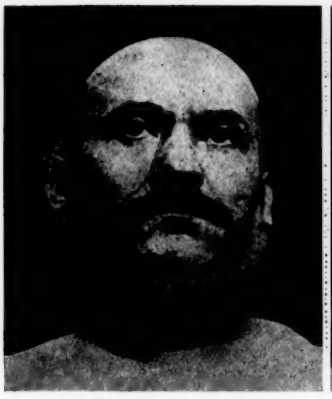

Fig. 2. Multiple lipomata. (Johnson's "Surgical Diagnosis," Vol. 1.)

Fig. 3. Branchiogenic cyst, New York Hospital. (Dr. Hartley.)

Fig. 4. Mixed venous and lymphangioma. (Johnson's "Surgical Diagnosis," Vol. 1.)

or totally, causing the existence of a fistula or cyst (8).

5. Lymphatic cysts (lymphangioma-cysticum). The first evidence of the formation of the lymphatic system is the development of symmetrical sacs in the neck, which have been called jugular sacs. These are first found in the human embryo as endothelial-lined sacs just lateral to the internal jugular veins. These jugular sacs become bridged or cut into by bands of connective tissue, this being the process by which each sac, originating from a plexus of blood-capillaries, is reconverted into a capillary plexus, lymphatic in character. Out of these lymphatic capillaries, chains of lymph-glands are evolved. The jugular sacs and thoracic duct may be termed a primary system; the secondary or peripheral lymphatics grow out from the primary system (Sabin, 58). Many of the lymphangiomata are found in connection with the sutures and fissures of the body. Thus we recognize macroglossia (tongue), macrocheilia (gums, lips), nævus lymphaticus (skin), etc.

6. Hæmorrhagic cysts. Since the human embryo, like that of all other vertebrates, possesses a row of definite gill bars or visceral arches, separated distinctly, externally by clefts, internally by entodermal pockets or pouches, so also its primitive vascular system is in conformity with this fundamental plan, and strong branches, connecting the dorsal and ventral aortæ—the aortic arches—each course in a visceral arch. Six of these aortic arches are recognizable in a human embryo 5 mm. long. Our present knowledge of the vascular system in the human embryo points to the fact that, normally, the first two aortic arches are lost, as far as their actual arch portions are concerned, but the third and left fourth arches are retained, becoming the root portion of the internal carotid and aortic arch, respectively. Certain portions of the remaining arches are retained, forming parts of the carotids, the pulmonary arteries, etc.; the remainder of the arches normally disappear (57). Faulty retrogressive changes in a certain portion of one of these aortic arches account for the presence of congenital hemangiomata. Their situation always corresponds to embryonic lines of fusion, such as the facial or branchial clefts (59).

7. Hygroma. Embryologically speaking, a hygroma is probably the result of fœtal sequestration of lymphoid rests (10). It has also been suggested that its origin may be from the intercarotid ganglion. Kirmisson (14) thinks its origin may be either venous or lymphatic. On account of their pseudomalignant independent power of growth it has seemed best to consider hygromata as differing from lymphangiomata.

8. Dermoid cysts. Embryologically, both sequestration and tubulodermoids may occur in the neck. In the first instance, a portion of surface epithelium becomes pinched off and continues to develop beneath the skin surface. In the latter case a portion of embryonic canal (branchial cleft, thyroglossal duct) remains patent and a mixed dermoid results (60). Batut (23) restricts the use of the term "dermoide" to tumors of the neck containing ectodermic inclusions, classifying as "mucoides" those representing endodermic inclusion. Kirmisson (14) also states that dermoids of the neck represent a retention of epidermal cells, whereas mucoid

cysts are lined with cylindrical epithelium, often possessing vibrissæ.

9. Carotid body tumors. There is little uniformity of opinion regarding the embryologic derivation of this "body," 5 mm. long, 3 mm. wide, and 2 to 5 mm. thick. Collison (9) states that it is "of doubtful embryological derivation, of undetermined function, inconstantly present, but occasionally giving rise to tumors of definite structure." Funk (8) believes it represents the remains of the upper part of the thymus anlage.

Many investigators, such as Zuckerkandl (38), McMurrich (39), Stilling (45), Kohn (46), Keith (47), and others, classify it with the "sympathochromaffin system anlage" which buds off from the central nervous system. Steide (48), Rabl (49), de Meuron (50), and others, maintain that it represents an embryonal rest from the third or fourth branchial cleft, while Kastschenko (42), Paltauf (43), and Monckeberg (44) look upon it as being a connective-tissue structure derived from the perithelium of the carotid arteries. It would, however, seem to be a well-established fact that this carotid body consists essentially of a loose connective-tissue capsule and meshwork, containing chromaffin cells similar to those found in the medulla of the adrenals, in the pituitary, and in the ganglia of the sympathetic nervous system. Physiologically, we have at present very little knowledge concerning this body. Experimentally, its action on blood-pressure is contradictory. The fact that it is not constantly present indicates that its function—if any—is unimportant. However, we must remember that the different parts of the chromaffin system, while of common embryology, possess different functions. Thus, the medulla of the adrenals affects blood-pressure, its cortex has an influence on the development of the sexual apparatus, the pituitary seems to possess a trophic influence, etc. (9).

PATHOLOGY

1. Branchiogenic fistula: (a) Complete. The proximal (internal) portion is lined with cylindrical epithelium (hypoblastic); the distal (external) portion is lined with flat pavement epithelium. The hypoblastic portion also contains a layer of lymphoid cells in its wall. The discharge consists of clear stringy mucus, or of a thinner, milky or turbid fluid resembling thin pus. It may also contain particles of fluid or semisolid food.

(b) Incomplete. The lining may be wholly of cylindrical epithelium, of flat pavement epithelium, or a combination of both varieties.

(c) Cysts. These have a wall of more or less dense fibrous tissue, containing lymphoid tissue if the cyst arises from the inner embryonic layer. They are lined with pavement epithelium or cylindrical ciliated epithelium; sometimes with membrane containing all the structures of the skin. They are usually unilocular; occasionally multilocular. Their contents varies; it may consist of clear serous fluid, of mucus, of oily material, or of fatty material of solid or semisolid consistence. The walls may undergo suppurative or degenerative, even malignant, changes.

2. Thyroglossal: (a) Fistula. The deeper portion of the fistulous tract is lined by ciliated epithelium; that part nearest the foramen cæcum of the tongue with flat epithelium.

(b) Cysts. They are lined with flat or ciliated epithelium.

3. Aberrant or supernumerary thyroids. In the downward migration of the thyroid gland through the thyroglossal duct from the base of the tongue to its final location, some thyroid cells may become dislodged and remain along the duct (8). Occasionally the entire thyroid gland may remain sublingual and its removal be followed by myxœdema (Murphy, 2). These embryonal rudiments may be multiple, giving rise later in life to multiple goiters (Yakubowski, 25). In general, it may be stated that aberrant or supernumerary thyroids are subject to the same pathologic changes which may occur in the parent gland.

4. Hemangioma (cavernosum). These are always in the nature of fissural angiomata. At first they may appear as simple telangiectases; when fully developed, they present numerous large vascular spaces or sinuses, lined with endothelium, resembling the structure found normally in the penile corpora cavernosa.

5. Lymphangioma. Their structure is in most respects analogous to that of the hemangioma, save that the vascular spaces contained therein are lymph channels instead of blood-vessels. The supporting stroma in which the vessels are embedded may be fibrous, fatty, or mucinous. In the cavernous variety the lymph channels are very numerous and much dilated, so that the structure, on section, has a somewhat spongy texture. The supporting stroma is scanty, thin, delicate, and transparent. Cysts, varying in size from that of a pea to that of a walnut or larger, may be produced. As in the case of hemangiomata, lymphangiomata of the neck occupy, or originate at, the site of the branchial clefts.

6. Hygroma. These are usually large, multilobulated, containing as many as one hundred pockets in a single tumor. The cyst walls are thin and consist of endothelial cells supported by a loose connective-tissue stroma. They are pecu-

liar in having an independent power of growth sufficient to force them into the surrounding tissues (Dowd, 10). Some of them extend from the lower jaw to the clavicle and from the median line almost to the spinous processes of the cervical vertebræ. They have a tendency to penetrate muscles (pseudomalignant); many of them even pass under the clavicle and form an axillary cyst, or under the manubrium to the anterior mediastinum (Kirmisson, 14).

7. Dermoid cysts. The majority of cases of dermoid cysts reported were due to imperfect closure of the second branchial cleft. As a rule they are lined with stratified squamous epithelium, without other skin structures (epidermoid cysts); occasionally the cyst wall will also contain hairs, glands, and fat (dermoid cysts).

8. Carotid body tumor. From a histologic point of view, these tumors resemble endotheliomata or peritheliomata of the suprarenals (Lilienthal, 11). Their normal size varies from that of a grain of rice to a grain of corn. They reach a certain size when from 20 to 30 years old, remain stationary for a time and then the connective tissue only increases. The interlobular blood-vessels thicken, with resulting sclerosis and atrophy.

The consistence varies, but the tumor is usually moderately hard and elastic. In color it varies from a reddish gray to a reddish brown. When present, the carotid body is found most commonly a little posteriorly to the bifurcation of the common carotid artery, lying between the internal and external carotids, and more closely united to one or the other of them. It is attached to the one on which it lies by the "ligament of Mayer," through which it receives its blood supply. The nerve supply is abundant and is connected with both the cranial and sympathetic nerves. It receives branches from the vagus and glossopharyngeal, superior laryngeal, and superior cervical sympathetic ganglion.

Fibers pass from the vagus, glossopharyngeal, and sympathetic, to form a plexus in the angle of bifurcation just in front of the carotid body. Many fibers from this plexus penetrate the capsule of the organ.

These tumors may remain quiescent for many years. Lilienthal's case (11) was that of a woman 60 years of age who had noticed the tumor for 35 years. When malignant changes occur, the growth of the tumor and infiltration of the carotid sheath and surrounding tissues may be very rapid. Funk (8) reports a tumor 8x5 cm., with pressure upon or involvement of the superior cervical sympathetic ganglion, causing contraction of the pupil on the affected side.

SYMPTOMS

Subjectively, there are absolutely no symptoms in the vast majority of these cases. If old enough, patients suffer from a varying degree of mental distress caused by the visible presence of a disfiguring tumor or fistula; they may complain of a sense of tightness in the neck, increased by excitement or overexertion; in the case of multilocular hygromata they have reported a gurgling sound on coughing (due to compression of one cyst by the sternomastoid, forcing the fluid content into a neighboring cyst). Fistulæ or cysts may, however, become inflamed or infected, giving rise to the common subjective findings of acute or subacute inflammation.

In a case recently operated upon by the reviewer, the patient, a woman 72 years old, with an incomplete internal branchial fistula (see Fig. 1), had all her lifetime been obliged, after each meal, to evacuate the contents of her cystic fistula into the pharynx, semisolids and liquids being forced into the sac during each act of diglutition. Notwithstanding this repeated traumatism, it was only within recent months that the fistula had become infected, occluding its lumen with subsequent putrefaction of the contents of the cyst. The inflammatory symptoms alone, brought her to the operating table. Of special interest are the subjective symptoms of imperfect closure of the upper portion of the thyroglossal duct, forming what might be termed an exaggerated foramen cæcum. Dr. T. W. Lewis of Chicago has reported (but not published) several such cases. The patients suffered from spasmodic cough and irritation of the pharynx which was relieved only by cauterization of the foramen, usually to the depth of one-half to three-quarters of an inch. In every case reported by Doctor Lewis, touching the opening of the foramen cæcum with the tip of a probe invariably produced an attack of severe spasmodic coughing.

Even carotid body tumors give rise to few subjective symptoms until they begin to infiltrate the carotid sheath, producing pressure symptoms on the vagus, superior laryngeal, and superior cervical plexus of nerves (disturbances of phonation, dysphagia, dry cough, deafness, conjunctivitis).

Objective: (a) Fistula. If of the second branchial cleft, the external opening lies in the skin of the neck, between the anterior border of the sternomastoid muscle and the median line anteriorly, and between the greater cornu of the hyoid bone and the sternoclavicular joint of the same side. The external opening is usually very

small, often so small as only to admit a filiform guide or a bristle. The inner opening lies in the neighborhood of the tonsil, in the lateral wall of the pharynx, or near the pillars of the fauces. In the complete fistula it is sometimes possible to inject fluid through the external opening into the pharynx; the passage of the fluid into the pharynx may be recognized by the patient by its taste or by the surgeon by its color (strychnine, quinine, milk, or methylene-blue solution) (60).

The discharge from a complete fistula is a thin clear mucus; that of an incomplete external is thicker and more turbid; while the incomplete internal variety discharges a thick mixture of mucus and epithelial or endothelial elements admixed with particles of more or less decomposed food.

A fistula of the thyroglossal duct is always median, between the lower margin of the hyoid bone and the sternal notch. Branchiogenic cysts are single, soft, freely movable, not tender (unless recently inflamed), and are never in the median line. Thyroglossal cysts are usually smaller and always in the median line. Collison and MacKenty (9), describe the objective findings of a carotid body tumor as follows:

1. Early. A tumor varying in size from a kernel of corn to a robin's egg, situated under the sternomastoid or at its anterior margin. It is egg-shaped, single, discrete, firm, elastic, moves easily laterally but not vertically, is pulsating (but not expansile), and may give a bruit on ausculation.

2. Late. Paralysis of vocal cords (due to involvement of recurrent laryngeal nerve while its fibers are still within the vagus), difficult phonation and deglutition, congested larynx, irregular pupils with no reaction to light on the affected side, lessened mobility of tumor, loss of weight and progressive cachexia (9).

F. S. Mathews (29) reports a case in a man 27 years old, of presenting hemiatrophy and paralysis of the tongue, in addition to other classical findings. The left side of the pharynx was pushed inward and the left tonsil occupied a position near the median line.

DIFFERENTIAL DIAGNOSIS

O. C. Smith (6) has worked out a very exhaustive outline of tumors of the neck which the reviewer appends in full.

1. Inflammatory:
   - (*a*) Acute:
     - Parotitis, submaxillary adenitis
     - Cervical lymphadenitis
     - Furunculosis
     - Carbuncle
     - Anthrax, actinomycosis
     - Ecchinococcus
   - (*b*) Chronic:
     - Chronic lymphadenitis
     - Tubercular or syphilitic adenitis
     - Hodgkin's disease
     - Mickulicz' disease
2. Embryologic malformations:
   - Branchial cysts
   - Thyroglossal cysts
3. Neoplastic:
   - (*a*) Benign:
     - Lipoma, fibroma, chondroma, osteoma, sebaceous cyst (wen.), angioma,
       - (1) Hemangioma
       - (2) Lymphangioma (hydrocele)
     - Hygroma
     - Teratoma
       - (1) Dermoid cysts
       - (2) Mixed tumors of salivary glands
   - (*b*) Malignant:
     - Carcinoma (epithelioma)
     - Sarcoma
     - Lymphosarcoma
4. Tumors of special organs:
   - (*a*) Thyroid:
     - (1) Physiologic hypertrophy of puberty, menstruation, and pregnancy
     - (2) Colloid adenoma (goiter) with or without cysts
     - (3) Parenchymatous hyperplasia
     - (4) Fœtal adenoma
     - (5) Malignant disease,
       - *a*. Carcinoma
       - *b*. Sarcoma
   - (*b*) Carotid body tumor
   - (*c*) Aneurism of aorta and carotids
   - (*d*) Tumors of larynx

The true nature of a fistula of the neck can be ascertained readily by inquiring into the history of the case. Only branchial or thyroglossal fistulæ are congenital. Tubercular adenitis, late carcinomata, or sarcomata and lymphangiomata, or hygromata (the last two only as the result of exploratory puncture or traumatism) may give rise to fistulæ. Cysts of the neck must be differentiated from the following: (1) cervical lymphadenitis, (2) carcinoma, (3) sarcoma, (4) fibroma, (5) lipoma, (6) Hodgkin's disease, (7) syphilis, (8) aneurisms, (9) aberrant or supernumerary thyroid, (10) carotid body tumor.

TREATMENT

The correct treatment of congenital deformities of the neck is to leave the benign cases alone unless their removal is desired for cosmetic reasons or on account of inflammatory pressure symptoms, and to remove early and radically, growths having a malignant or pseudomalignant tendency such as lymphangiomata, hygromata, and carotid body tumors. It should become axiomatic, for instance, that a solid tumor of long standing, situated in the anterior triangle of the neck, at or near the level of the lower border of

DIFFERENTIAL DIAGNOSIS OF CONGENITAL

Tumor	Age	Location	Single or Multiple	Density	Superficial or deep	Motility	Fluctuation
Branchiogenic cyst	Congenital	Anterior triangle of neck	Single	Soft	Superficial; may extend deeply	Movable unless infection has occurred	Present.
Thyroglossal cysts	Congenital	Median line below hyoid	Single	Soft	Subcutaneous	Freely movable	Usually present.
Lumphadenitis	Youth	Anterior or posterior triangle	Multiple as a rule, often matted together	Hard at first, later softer	Both as a rule	Slight or absent	Absent early.
Carcinoma	Aged	Depends on site of primary focus	Multiple nodes	Stony-hard, except in late cases with sinus formation	Deep	None	o
Sarcoma	Youth or early middle life	Angle of jaw, sternomastoid	Multiple nodes	Softer than carcinoma	More superficial than carcinoma	Early motility	o
Fibroma	30–45	Very rare in this location	Usually single	Hard	More superficial	Freely movable	o
Lipoma	Any age	No anatomic boundaries; not uniform	Single or multiple	Doughy or "woolly" soft	Superficial	Movable in all directions	o
Hodgkin's disease	10–40	Bilateral as a rule	Multiple, in chains or discrete	Softer than malignant tumors, harder than tubercular glands	Feel like lipomata but are more deeply seated	Movable	o
Syphilis	Any age	Submental or submaxillary glands. Look for chancre	Single or multiple	Hard, painless, adherent	Both	Early lost	o
Hygroma	Congenital	Inferior maxilla to clavicle; may pass to axilla or anterior mediastinum	Multiple; there may be as many as 100 pockets	Soft	More superficial than carotid body tumors	None	May fluctuate; impulse on coughing.
Aneurism	Middle age especially	Carotids especially	Single, usually fusiform	Soft	Deep as a rule	Usually none	None
Carotid body tumor	20 to 50 in 75 per cent of cases	Under sternomastoid or at its anterior border	Single, egg-shaped discrete	Firm but elastic	Deep	Lateral motility but no vertical motility	None.

the thyroid cartilage, should be looked upon as a possible carotid-body tumor and removed before it involves the surrounding structures—particularly the carotid sheath. The general modus operandi is essentially that of the radical removal of tubercular glands of the neck. Bearing in mind the probable embryologic derivation of the fistula or tumor, one should resort to a careful dissection of the growth while constantly bearing in mind the tissues and structures which are to be avoided. In the extirpation of hemangiomata, the reviewer has made use of coagulene Kocher-Fonio, in order to minimize hæmorrhage (61). A 5 to 10 per cent solution is injected around the base of the angioma just prior to its excision. Extirpation is much facilitated thereby. The radical extirpation of a complete branchiogenic fistula requires painstaking care. A small probe or ureteral catheter (Dowd, 51) may be passed through the external opening as far up as possible. A circular incision is then made around its external margin so as to leave a disk of skin around the stoma of the fistula. This is followed by the usual oblique incision parallel to the anterior border of the sternomastoid, including skin, superficial fascia, and platysma. The sternomastoid is retracted outwardly and the dissection will proceed easily as far as the bifurcation of the carotids. From this point on, no sharp or pointed instruments should be used. The final dissection—up to the pharyngeal wall—becomes a slow process of "teasing out" the fistula from the surrounding tissues. With the patient's mouth held open, and using a head mirror, tugging on the fistulous tract will cause a dimpling in, below the tonsil or on the lateral pharyngeal wall. Having freed the entire tract, one of three procedures may be employed to

MALFORMATIONS OF THE NECK

Gurgling	Pulsation	Bruit	Specific reaction	Fistula	Course	History	Cachexia	Aspiration
None	None	None	o	May be present; may open in mouth or externally	Slow	Congenital	o	Clear or turbid fluid.
o	o	o	o	Rarely present	Slow	Congenital	o	Clear, thin light fluid.
None	o	o	Tuberculin	Late broken down sinus	Sub-acute	Tuberculous	o	Pus in late cases.
o	o	o	o	Only in terminal stage	Rapidly progressive	Primary focus	Present	o
o	o	o	o	Only in terminal stage	Progressive	o	Late	o
o	o	o	o	o	Chronic	o	o	o
o	o	o	o	o	Chronic	o	o	o
o	o	o	Blood picture, splenomegaly	o	Progressive	Irregularly progressive	Late	o
o	o	o	Wassermann positive	o	o	Chancre, etc.	o	o
o	o	o	o	Only after trauma or aspiration	Fairly rapid; extends between fascial layers esp.	May begin as a single cyst, but spreads rapidly	o	Clear, thin fluid.
Present	Expansile, delayed temporal artery pulse on affected side	Present	Wassermann positive	o	Fairly rapid	Syphilis	o	Fatal
o	Present but not expansile	Present	o	o	Long history of slow growth	Rather sudden change to malignancy	Only very late	o

complete the operation. Von Hacker (54) cuts off the fistula three-quarters of an inch from the pharyngeal wall. An eye probe or small catheter is then pushed through the fistula into the pharynx and sutured to the distal end of the tract. By traction through the pharynx, complete inversion is obtained. The stump usually separates or tears away readily from the mucosa. The opening thus left is sutured with catgut. Wishing to preserve the entire cyst and tract in one of his cases, the reviewer proceeded as follows: Having dissected the tumor up to the pharyngeal wall, two clamps were placed on either side of the tract, in such a manner as not to occlude its lumen. A third clamp was then placed squarely across the neck of the tumor, just distal to the guy clamps, and the mass removed *in toto*. The remaining fistula was then cauterized with pure carbolic acid and a catgut ligature thrown around the guy clamps, proximal to them, and tied. The clamps were then removed and the incision closed without drainage. The result was perfect. For those cases where adhesions to the carotid sheath make complete dissection impossible or extremely dangerous, Koenig (53) has devised an ingenious method of treatment. He frees the distal end of the fistulous tract as far as he can, and then passes this free (distal) end through the mucous membrane in front of the tonsil and stitches it there, thus leaving a curved sinus with an internal opening at each end—the posterior one pharyngeal, the anterior one buccal.

Thyroglossal fistulæ or cysts should always be injected with methylene-blue and every particle of stained tissue removed. The usual procedure has consisted in shelling out the cyst as far as the hyoid bone. Inasmuch as the tract invariably passes either through or behind this

bone, cures have only been affected in those cases where the duct is represented by a fibrous cord proximal to the hyoid. Recurrences have been the rule. McKenty (13) mentions one case where three successive operations were necessary; even then he does not state whether the third operation was a permanent success. Chiseling or drilling through the hyoid bone, followed by cauterization, is recommended in obstinate cases.

The extreme thinness of the walls of a hygroma makes a clean dissection of the entire tumor almost a surgical impossibility. Portions will tear and remain behind, leading to extremely rapid recurrences. Dowd (10) operated on a girl, not quite three years old, removing the cyst as far as the sternum. It promptly recurred, and at the second operation he was obliged to extend his dissection as far back as the scaleni muscles. This case died on the tenth day from shock and hæmorrhage. A preliminary injection with methylene-blue is absolutely indicated in these cases.

The operative mortality of carotid-body tumors is formidable. Collison and Mackenty (9) collected 60 cases up to the year 1913. Of these, 54 were operated upon. In 4 cases, the operation was merely exploratory in nature; in 32, the common external and internal carotids were ligated; in 7 only the external carotid was ligated; in 15 cases the tumor was dissected away from the blood-vessels or dissected away from the internal carotid or the common carotid after ligation of the external. Recurrences occurred in 6 of these 15 cases; whereas only 2 recurred after complete removal of all the carotids. Immediate death occurred in 12 cases; of the 42 who convalesced, 4 had prompt recurrences, and in 6 other cases speedy deaths were in prospect from recurrences known to have existed when the cases were reported. We thus have an operative mortality of 25 per cent and a prospective mortality of 40 per cent, a far from encouraging outlook. Desgouttes (1) reports the successful removal of a tumor *en bloc* with the internal jugular vein and the pneumogastric, the internal carotid being saved. He has also successfully removed the pneumogastric, the sympathetic plexus, the internal jugular, and the internal carotid in another patient. He does not state, however, whether or not either of his patients succumbed to recurrences. Lilienthal (2) ligated and resected, above or below the tumor mass, the internal jugular and all three carotids, saving the pneumogastric. Twenty-four hours after the operation, his patient developed central aphasia and right hemiplegia. There was no aphonia, but the left eyeball softened and its pupil contracted. All symptoms except the contracted pupil disappeared in a few days. He ascribes the pupillary contraction as probably due to injury of the superior sympathetic cervical ganglion. It is therefore self-evident that a large percentage of these tumors will be considered inoperable by conservative surgeons. If seen early, dissection away from the carotid bifurcation, leaving the vessels *in situ*, has been suggested (9); in all other cases, if operation is undertaken, the mass should not be dissected away from the blood-vessels but the carotids and internal jugular vein should be removed *en masse*, after freeing the pneumogastric.

SUMMARY

1. The pre-operative diagnosis of congenital deformities of the neck is all too seldom made. A careful history and examination of the deformity, oftentimes aided by the injection of either bitter tasting or coloring substances, will enable the surgeon to make a correct pre-operative diagnosis.

2. No operation should be undertaken unless the surgeon is prepared to carry the same to a complete conclusion. Partial removal of a secreting wall is worse than leaving it *in situ*.

3. The desirability of operating on carotid-body tumors must depend on: (1) a very early diagnosis, while the tumor is still benign; (2) in late cases, on the desperate nature of the patient's symptoms (paralysis of vocal-cords, stenosis of pharynx, hemiplegia, hemiatrophy, paralysis of tongue, etc.).

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ABSTRACTS OF CURRENT LITERATURE

GENERAL SURGERY

SURGICAL TECHNIQUE

OPERATIVE SURGERY AND TECHNIQUE

Grant, W. W.: The Immediate and After-Treatment of Railway Injuries. *South. M. J.*, 1916, ix, 357.

The circumstances, conditions, and environment of railway injuries are unfavorable to the best treatment so that tentative measures only should be used until the patient is in more favorable surroundings. The immediate application of hydrogen peroxide and iodine with dry sterile gauze is recommended for wounds. Fractures should be temporarily immobilized.

Hæmorrhage is a common condition in railway injuries and many times is incorrectly treated. Pressure to stop the hæmorrhage should be used for as short a time as possible, as tissue necrosis and subsequent sloughing may result from prolonged anæmia of the parts.

Shock is frequently unscientifically treated and its presence many times disregarded. No serious operation should be performed in the presence of shock. To combat shock dry heat applied to the body, hypodermoclysis, rectal saline, and sugar solutions are recognized agents.

Fractures should be treated if possible without the open method; especially should all compound fractures be left alone as regards surgical approximation of the fragments, for at least ten days or two weeks following the accident.

Conservative surgery as regards feet and hands is very important. Ragged wounds should be left open to allow free drainage. Muscles, tendons, and nerves should be carefully sutured. Skull fractures should be carefully explored and all fragments and bone débris should be removed.

J. H. Skiles.

Barclay, A. E.: Preliminary Note on a New Method of Bullet Extraction. *Arch. Radiol. & Electrotherap.*, 1916, xx, 359.

Barclay's method is an elaboration of the scheme of marking the location of a foreign body by inserting a large needle into the tissues until the body is reached, using the fluoroscope to guide the needle. Instead of inserting a needle he uses two prongs, one longer than the other, the point of the shorter prong fitting into the depression near the point of the longer one to make the insertion easier. The outer ends of the prongs have handles arranged at right angles to avoid the screen and made like scissors so they can be opened and closed. He has also arranged his instrument electrically so that a bell rings when a metallic body is in contact with the prongs. Fourteen cases are reported in which the foreign bodies were removed with a small skin incision and without the mutilation of tissue usually required in such cases.

J. G. Burk.

Cathcart, C. W.: Methods of Preparing Sphagnum Moss as a Surgical Dressing. *Lancet*, Lond., 1916, cxc, 820.

A description is given of a simple and economical method of sterilizing sphagnum moss. The absorbing qualities of the moss are superior to cotton wool. The moss is first picked clean of grass and leaves and suitable quantities are placed in small flannelette bags, which are immersed in bichloride solution so that the moss is impregnated with one-fourth of one per cent of bichloride of mercury. The bags are then hung up to dry in a room heated with a slow combustion stove. They are then compressed by an ordinary clothes wringer and are ready for packing. Care must be taken in shipping that the moss is not exposed to moisture, otherwise it will swell and burst the packing boxes.

H. G. Sloan.

Tovey, D. W.: The Nerve Supply of the Lower Abdominal Wall as Related to the Pfannenstiel Incision. *Am. J. Surg.*, 1916, xxx, 145.

Special care should be taken in any abdominal incision not to injure the nerves supplying or crossing the cut structures, since such nerve injury predisposes to hernia by causing paralysis of muscle or atrophy from disturbed nutrition or loss of sensation.

The course and distribution of the nerves of the lower abdominal wall are described, especially those which may come in the field of a Pfannenstiel incision, principally the anterior divisions of the twelfth dorsal and the hypogastric branch of the first lumbar.

In the Pfannenstiel incision, after the aponeurosis has been separated from the muscle and the linea alba divided and the upper flap retracted, two or sometimes four large nerves can be seen coming up from the recti about an inch from the median line

and piercing the anterior fascia. These are the anterior divisions of the twelfth dorsal nerve. They are often half as thick as a match, double, and accompanied by a blood-vessel. They should not be cut, as in retracting the upper flap they can be drawn out sufficiently in nearly all cases. The cutting of these nerves, according to Tovey, may account for the reported cases of hernia following the Pfannenstiel incision. LUCIAN H. LANDRY.

Maclennan, A.: The Prevention and Treatment of Some Obscure Conditions Complicating Convalescence After Gastro-Enterostomy. *Glasgow M. J.*, 1916, lxxxv, 313.

MacLennan considers the undesirable sequences of gastro-enterostomy, and describes an operation by the adoption of which these sequelæ may usually be prevented. The steps are as follows:

1. Except in infants, the new stoma is made on the pyloric side of the lowest point of the great curvature.

2. The colon is raised so as to display the mesocolon; that area which is freest of vessels, yet contiguous to the selected spot on the stomach wall, is divided vertically to the necessary extent.

3. The stomach is drawn through the slit in the mesocolon and clamped perpendicularly, occasionally with a slight inclination toward the pylorus, but never with the inclination toward the left. The omentum and colon are then returned into the abdomen.

4. The bowel to be attached is emptied by digital pressure and clamped when flat.

5. One continuous Lembert suture (silk) unites the two surfaces along the line which is sickle-shaped at the lower end and which is just off the free edge of the bowel. At the end of the line the thread is hitched under the last loop and caught lightly in a pair of pressure forceps, so applied that the serrations of the forceps cannot cut the silk.

6. The stomach is opened and a small circular section is removed from the entire thickness of the wall corresponding to the curvature in the line of the Lembert suture, making a racquet-shaped opening. The same is done to the bowel; but on no consideration is the mucous membrane of the latter excised in the slit part. The redundant mucous membrane at the upper part of the stoma offers some impediment to the entrance of bile, while the cutting out of a section of stomach and bowel leads to the formation of a gaping hole over the mouth of the efferent jejunum and facilitates evacuation of stomach contents.

7. The operation is concluded by suturing the openings together with catgut and then continuing the Lembert suture which has been laid aside. As little of the girth of the bowel is taken up as possible. The junction is placed inside the lesser peritoneal cavity, by uniting jejunum to the opening in the transverse mesocolon, for the greater safety thus gained in localizing possible leakage.

In the author's opinion bleeding from a duodenal or pyloric ulcer forms the sole indication for closure of the pylorus. Where hæmorrhage has occurred, all large vessels going toward the site of the ulcer are ligated. Closure of the pylorus has no influence in preventing bilious regurgitation.

Following gastro-enterostomy morphia is allowed during the first twenty-four hours only. The Fowler position is used; rectal saline is given every four hours, a dessertspoonful of brandy, and glucose on raisin tea being generally included. During the first twelve hours nothing is swallowed, though the mouth is frequently washed out with ice water. During the second twelve hours, sips of water acidulated with lemon juice are given every quarter hour. During the next twenty-four hours the water is increased to a half ounce, while during the latter part of this time dessertspoonfuls of buttermilk are given. On the third day the diet consists of beaten curds, buttermilk, lemon tea, coffee without milk, and sugarless stewed apples. On the fourth day calomel is administered (about 3 grains) in one-half grain doses, every quarter hour. This is followed by a suds enema containing asafœtida, quinine, or turpentine. Thrice daily, scrambled egg, banana and cream, malted milk, or fish cream in addition to the sour milk, apple, etc., is given. Thereafter the diet is gradually increased until at the beginning of the second week fruits (cooked or uncooked), chop, fowl, and fish are included. A sour wine may be taken advantageously with the meaty meal, but fresh milk after gastro-enterostomy must be avoided. Bilious regurgitation without vomiting in cases with urgent symptoms requires the stomach tube. After siphoning, the stomach should be washed out with warm water, and a few ounces containing a tablespoonful of vinegar left in. Small doses of opium or, better, one-twentieth grain of heroin may be given thrice daily to encourage gastric contraction, and retard the secretion of bile.

The mechanism of bilious regurgitation is well called a vicious circle, for the presence of bile induces conditions which encourage its continuance. In the presence of alkali the stomach relaxes, and the extra weight of the fluid increases the sagging of the organ, whose capacity for holding bile is further enhanced. As the overfilled organ sags, it inclines to close its exit by obliterating the lumen of the jejunum. The position assumed by the patient then becomes of importance in so far as it may relieve a downward pressure. Under these conditions, also, vibratory massage is efficient. Heat is comforting, and assists in the return of gastric tonicity. In the acute states of regurgitation, champagne, 2 to 4 ounces, will speedily produce amelioration. A peppermint liqueur is excellent for occasional bilious regurgitation. ALBERT EHRENFRIED.

Weeks, A.: A Simple Method of Giving Solutions by Bowel. *J. Am. M. Ass.*, 1916, lxvi, 1022.

After numerous experiences in watching the routine use of the Murphy drip after operations in various hospitals, the author came to the conclusion

that half of the distress complained of by patients is due to the retention in the bowel of gas or too much fluid. This is especially so in little children.

For some time he has used a method which consists of the usual container and dripper supplied by all hospitals with a small glass funnel; a funnel-holder which will fit on the container stand; 5 feet of rubber tubing, with a glass tip, and an ordinary rubber catheter to suit the case. The funnel hangs on a level with the patient's abdomen. The container is hung so that the dripper will drip into the funnel. The solution is allowed to drip only as fast as it is absorbed, and it is not necessary to keep it warm. EDWARD L. CORNELL.

ASEPTIC AND ANTISEPTIC SURGERY

Emery, W. D.: A Standard Method of Testing Antiseptics for Wounds, with Some Results. *Lancet*, Lond., 1916, cxc, 817.

The author has aimed to test antiseptics under the same conditions as when they are ordinarily applied to wounds. He uses blood as a medium because of the presence of blood in all fresh wounds, and further because pus, which would be the ideal medium, is difficult to obtain of a uniform type. Washed corpuscles were added to an equal amount of serum so that there would be no clotting while the experiments were being carried on.

He used the streptococcus fæcalis in testing the potency of the various antiseptics because it is the chief enemy in wounds; it can always be obtained in pure culture; it grows rapidly, so that the results can be secured in twenty-four hours; and furthermore it readily emulsifies so that there are no masses to resist the action of the antiseptic. In the author's technique he uses nine parts of blood and one part of 18-hour culture of the streptococcus, containing about 250,000,000 cocci per ccm. This solution was thoroughly mixed with an equal quantity of the antiseptic to be tested on a glass slide. Equal portions of this mixture were then sucked into two capillary pipettes and the ends sealed. Pipettes were then incubated, one for fifteen minutes and the other for one hour, and at the end of this time two loops from each pipette were inoculated on the surface of an agar plate. These plates were then incubated and the number of colonies determined after twenty-four hours.

Some antiseptics show fewer colonies after fifteen minutes than at the end of an hour, because of their faculty for combining with the protein in the medium in which the bacteria are mixed. This neutralization of the antiseptic with the protein has very nearly passed off at the end of an hour so that the remaining bacteria flourish more at this later period.

Emery found that by this method, Dakin's solution was only one-seventieth as powerful as carbolic acid. It was one-fortieth as powerful as biniodide solution, one-thirtieth as strong as lysol, and one-two-hundredth as strong as malachite green. Unfortunately, the action of this last antiseptic on the living cells is too powerful for clinical use.

The end-result of any antiseptic, in wounds, is a combination of its action on the infecting bacteria, coupled with its action on the fixed body tissue cells. This latter factor, the author has been unable so far to determine accurately, but he is working on this problem. HARRY G. SLOAN.

ANÆSTHETICS

Stanley, L. L.: Spinal Anæsthesia; Analysis of Two Hundred and Eighty Cases. *J. Am. M. Ass.*, 1916, lxvi, 1090.

In the 280 cases in which spinal anæsthesia has been used on the inmates at the San Quentin, Cal., prison, tropacocaine in 1.5 gr. doses has been the agent employed.

In ordinary operations, excepting those in which the abdominal viscera are handled, no hypnotic is given the patient before the operation. The patient walks to the operating room and mounts the table. Within one minute he feels that his feet are becoming warm, and he may even feel a tingling sensation in his toes. Within two minutes, sensation is lost about the anus and, as a rule, within about four minutes the loss of sensation is so great that operations for hernia may be done without pain. For operations above the umbilicus, the patient is allowed to stay in the Trendelenburg position for six or seven minutes, for apparently it takes that long for the tropacocaine to gravitate cephalad to bathe the nerves which supply these segments. For operations about the anus, the average Trendelenburg position has been 1.7 minutes; for operations on varicose veins 2.5 minutes; for operations on the scrotum 2.4 minutes; for hernia 3.1 minutes; and for gastro-enterostomy 4.2 minutes.

The conclusions are as follows:

1. In this series of 280 cases there has been no fatality.
2. There has been comparatively little shock.
3. There has been headache in only 8 per cent of cases.
4. There has been no pneumonia following the operation.
5. There have been very few post-operative complications.
6. There have been no permanent paralyses following the anæsthetic.
7. The period of convalescence has been shortened.
8. With the relaxed muscles, closing of the abdomen is greatly facilitated.
9. The blood-pressure has fallen in most cases, but in the average case not to a dangerous degree.
10. The height to which the anæsthetic is effective is influenced by the length of time the patient is in the Trendelenburg position.
11. The pulse-rate is not influenced to any marked degree by tropacocaine intraspinally administered. EDWARD L. CORNELL.

Mahn, G.: Practical Notes on Local Anæsthesia in Otorhinology (Notes oratiques sur l'anesthesie locale en oto-rhinologie). *Ann. d. mal. de l'oreille et du larynx*, Par., 1916, xl, 845.

In most interventions in the frontal and maxillary sinuses or in the mastoid not alone must the superficial layers be anæsthetized but also and especially the bony walls, internally as well as externally, trepanation of these cavities being usually followed by curettage. In order to obtain this result the author says that it is necessary and sufficient that the injection should be pushed into the exterior periostic layer. But the anæsthesia will be more perfect if a large part of the periostic surface enveloping the cavity is injected.

The author uses a novocaine solution, and three hours prior to its use he makes a hypodermic injection of pantopon or morphine. His technique is given in detail. W. A. BRENNAN.

Kroenig, B., and Siegel, P. W.: Shockless Surgery with the Help of Paravertebral Anæsthesia and Scopolamine and Narcophin. *Surg., Gynec. & Obst.*, 1916, xxii, 524.

Kroenig reports 670 cases of gynecological and obstetrical operations done under paravertebral anæsthesia at the University Frauenklinik in Freiburg, Germany.

The method consists in blocking the nerve-trunks directly at their exits from the intervertebral foramina, or from the sacral foramina for the sacral nerves, with a one-half per cent solution of novocaine suprarenin, tablets "A," prepared by Hoechst Farbwerke. The anæsthesia is preceded by two-thirds to one gram of veronal on the night before the operation, and 0.0003 gr. scopolamine and 0.03 gr. narcophin two and one-fourth and one and one-half hours respectively before beginning the anæsthesia, and half a dose of each one-half hour before anæsthetization if the twilight sleep is too light. For cachetic patients or patients weighing under one hundred pounds the dose is reduced to 0.000225 gr. scopolamine and 0.0225 gr. narcophin respectively, and 0.00075 gr. scopolamine and 0.075 gr. narcophin for the last dose if necessary. The anæsthesia continues uniform from two and one-half to three hours, and operation may be begun from fifteen to twenty minutes after anæsthetization.

The complications noted are of minor importance and may result from the condition of the patient or from the operation itself. No deaths resulting from the anæsthesia were noted. An attempt was also made to eliminate post-operative pain by dusting a powder, called "anæsthesin," into the wound as it was closed by layers. Apparently a reduction of pain was accomplished in most cases and in some there was a complete elimination of post-operative pain, but the resulting œdema in the wound and retardation of healing seem to be factors that more than outweigh the slight advantage gained, and the use of this powder has been discarded for the present.

Preceding the anæsthesia with scopolamine and narcophin eliminates the psychic shock due to the preliminaries of an operation, and patients often have no recollection of events from the time they receive their veronal on the night before operation until they recover full consciousness three to six hours after the operation.

The variety of operations done under this form of anæsthesia indicates its general applicability in general surgery as well as in gynecology and obstetrics, and the success of the Freiburg clinic warrants a fair trial by the profession. The technique is not as difficult as it might seem and requires only a definite knowledge of the distribution of the sensory nerves, or working according to tables compiled by experienced users of the method.

With the elimination of the post-operative pain, upon which problem the Freiburg clinic is still working, the method presents the ideal form of anæsthesia. Its chief advantages lie in the uniformity of the anæsthesia obtained, and in the lack of serious immediate or post-anæsthetic complications.

SURGICAL INSTRUMENTS AND APPARATUS

Thompson, G. S.: Some Surgical Uses of Celluloid. *Brit. J. Surg.*, 1916, iii, 696.

Celluloid used for surgical purposes varies in thickness from that of ordinary photographic films to that of thick cardboard. In cases where it is desirable that it become encapsulated it should be perforated with punch holes throughout. When infection does not occur the celluloid does not provoke irritation of the tissue sufficient to cause subsequent sinus formation or the extrusion of the celluloid. The celluloid is sterilized in the autoclave or by boiling. If crinkling is to be avoided the material must not be boiled for a long period. It is not an absorbable material.

Thompson suggests that celluloid might be used to advantage in the various types of herniæ. The precautions necessary to be observed in its use are pointed out by the author. In femoral herniæ the plate should be triangular in shape and should be provided with a flange on its outer border where it comes into relationship with the femoral vein. The plate for inguinal herniæ should be roughly elliptical and should have a gap for the passage of the cord at its lower border. In the skull thick plates are used, fashioned to suit the aperture. Perforations are avoided. Celluloid will be found preferable to other material, such as transplanted bones — phalanges, pieces of rib, etc., in plastic operations on the nose for restoring the bridge. Thompson suggests the possibility of using celluloid caps for the ends of bones after certain operations. For this purpose he suggests that there be kept on hand a series of casts and molders in different sizes corresponding to the commoner joints involved. The celluloid is softened and applied to the cast, and it is then worked into shape with the molder. The whole is then placed in cold water to harden.

It is suggested that celluloid be used for medullary pegs after fracture. The advantages claimed for the medullary peg of celluloid are: it is not brittle; it gives perfect alignment; does not interfere with osteogenesis, and therefore does not favor non-union; causes only slight disturbance to parts; causes no discomfort to the patient; it requires only a minimum of trauma for its introduction; the operation is rapid. In the author's opinion the alleged defects of pegs do not exist, and granted a correct technique, gratifying results may be anticipated. He believes that this method is destined to supersede the others.

Spina bifida is a condition in which ideal closure of the gap can be made by a properly shaped celluloid plate. A flame-proof celluloid known as "taxuloid" is now on the market. ISIDORE COHN.

Johnson, C. C.: Fracture Splints. *Lancet-Clin.*, 1916, xvii, 373.

The author uses tin as material for splints, and believes it most practical, especially for the country practitioner. The tin splint is most advantageous because it is light in weight, is firm and strong, is capable of being molded, and can be sterilized.

J. R. MARTIN.

SURGERY OF THE HEAD AND NECK

HEAD

Von Hacker: The Plastics of Penetrating Cheek Defects Due to Gunshot Injuries (Plastic bei penetrievanden Wangen Defekt und nachfolgender narbeger Kieferklemme insbesondere nach Schussverletzungen). *Beitr. z. klin. Chir.*, 1916, xcviii, 289.

Von Hacker's method of remedying defects of the cheek due to gunshot wounds is divided into two stages.

In the first stage an Israel flap is cut from the cheek down the neck commencing close to the defect but in such a way that a strip of skin is left between the defect and the flap. This strip is termed the bridge. The flap, which hangs from the cheek, is turned over, passed under the bridge, and part of it covered over the defect. This is sutured to the edges of the defect, and the former outer skin surface of the flap thus forms the interior lining of the mouth at the defect. The edges of the flap site are approximated.

The second stage of the operation takes place when the flap has healed in the defect. This consists in severing the lower edge of the bridge and with this and the unused portion of the turned over skin-flap patching over the external surface of the defect and approximating edges.

The author illustrates his procedure by several diagrams clearly showing the steps in the operation. He also shows some photographs of the excellent results obtained. He points out that his method by allowing the flap to be nourished during the healing process prevents necrosis and is thus superior to other methods in use. W. A. BRENNAN.

Perry, R. St. J.: Pons Nasi. *Am. J. Clin. Med.*, 1916, xxiii, 309.

The author describes in detail the method of making a plaster cast of the nose in deformities thereof.

An attempt is then made to correct the deformity by one or more procedures. Submucous resection with straightening of the nasal bones may give the result desired. When depressed areas are present, a piece of cartilage from a rib may be inserted to fill out the nasal contour. When unsightly projections are present these may be curetted off subcutaneously with a special spokeshave. An injection of paraffin must sometimes be resorted to finally. J. H. SKILES.

Vilvandré, G.: Radiography in Gunshot Wounds of the Skull. *Arch. Radiol. & Electrotherap.*, 1916, xx, 306.

The point which the author wishes to emphasize is that owing to the bad prognosis in lesions in which a foreign body has lodged in the brain, no operation should take place on a skull which has not been previously radiographed to ascertain the presence or absence of a foreign body and its careful localization.

To trephine a skull for a depressed fracture will of course give relief; but a patient with a bullet or piece of shrapnel in his brain will, with perhaps a few remote exceptions, die within six months of cerebral abscess. The only exception which might be allowed is that in which the bullet is not distorted through a previous ricochet and is in all probability aseptic. The first point can be determined by the X-ray. HOLLIS E. POTTER.

Lee, J. R.: Removal of Intracranial Foreign Body Under X-Rays. *Brit. M. J.*, 1916, i, 447.

Attempts to locate a piece of shell in the occipital lobe with a probe or to remove it with an electromagnet having been unsuccessful, the X-ray screen was tried. The operator was clearly able to see a probe which had been passed in along the track and the fragment which had been pulled forward by the magnet and was caught in brain tissue. Removal of the fragment was effected by means of a crocodile forceps passed along the track to a depth of four inches. Noting the relation of the fragment to the instrument during the process of removal may prove of material assistance.

E. K. ARMSTRONG.

Whitaker, R.: Gunshot Wounds of the Cranium. *Brit. J. Surg.*, 1916, iii, 708.

The author reviews the results of his observations on 106 cases of cranial injuries which have been re-

ceived for treatment from seven to ten days after the injury. Of this number 88 were penetrating or perforating wounds of the brain.

The operative treatment originally advocated by Sir Victor Horsley was the method of procedure adopted in these cases. It is in the main as follows:

1. The injured and septic area of the scalp must be freely excised.

2. The injured area of skull must be freely exposed by suitable incisions and turning down suitable flaps.

3. Normal dura mater must be freely exposed around the entire circumference of the wound which it penetrates, by a wide removal of bone. Foreign bodies, blood, and pus must be removed from the brain, without breaking down protective adhesions. The whole wound must be left open from the first.

In wounds where the bullet has perforated the brain the wounds of entrance and exit must be treated alike. When the wounds of entrance and exit are close to one another the two openings are joined — a new factor, that of decompression, is appreciated in the treatment of these cases. It soon became apparent that these cases did better than those in which the wounds of entrance and exit were not so close together. Cerebral herniæ in these cases did not become strangulated but ultimately "retired inside the dura mater, which in the end became slightly concave." Whitaker has made it a practice to remove those foreign bodies and fragments of bone which are obvious, but he has not searched at length for them, as he has found that the brain is far more able to take care of itself in this direction than is ordinarily believed.

The length of time taken for the operation is an important factor in preserving the patient's life. Speed and free decompression have been the dominant ideas in these cases. The type of infection has been an important determining factor. Streptococcal infection has been fatal in 90 per cent of cases. It is not usually associated with the formation of adhesions; the hernia grows rapidly and is not covered by a protective membrane. In the cases showing a staphylococcal infection the patient makes an amazing fight; when death occurs it is due to infection of the ventricles through a narrow track. These cases show a marked protective covering for cerebral herniæ.

As to the technique employed, chloroform and oxygen have been given. The local preparation of the scalp consists in washing with petrol, with methylated spirits, and then with iodine. From the beginning of the operation the wound area is continuously irrigated with 1:40 carbolic. Bleeding vessels are ligated, but forceps are left on for twenty-four hours. Bleeding from the dura and sinuses are dealt with by muscle-grafting.

The muscle-graft not only serves to control hæmorrhage but it serves as a center for granulation formation. When the bony parts are removed the irrigating fluid is changed to hydrogen peroxide. All obvious foreign bodies are removed and the wound dressed; prior to this, however, an unperforated piece of rubber is placed over the dura. The wound is dressed with a 1:20 carbolic or cyanide gauze. Morphine is given as necessary. Urotropine is the only other drug given (10 grains every 6 hours). The first dressing is applied after 6 hours, and the forceps are removed.

Lumbar puncture has been used in only a few cases in this series. The effects of lumbar puncture are very transitory; its performance cannot fail to mean an added strain to a case that has already as much as it can bear.

Under good conditions it is probable that every case of fracture of the skull should be operated upon within the first three days after arrival at the hospital; when cases are received after fourteen days it is probably best not to operate unless there "be definite clinical manifestations of increasing intracranial mischief." During the intervening period the following conditions demand immediate operation: active septic processes in a badly drained wound; evidence of cerebral irritation or compression; coma and slow pulse. ISIDORE COHN.

Jackson, H.: Craniopharyngeal Duct Tumors. *J. Am. M. Ass.*, 1916, lxvi, 1082.

Jackson reports one case and refers to 37 cases collected from the literature of tumors arising from rests of embryonic tissue along the course of the craniopharyngeal duct.

These rests of buccal epithelium, which may occur within the persistent canal and at the cranial extremity of this canal in the region of the infundibulum and anterior lobe of hypophysis, may give rise to cystic or solid tumors.

These hypophysis duct tumors lie in the median line at the base of the brain, bounded anteriorly by the optic chiasmus, posteriorly by the pons, above by the floor of the third ventricle, and below by the sella. Laterally they may encroach on the cerebral peduncles and temporal lobes. The circle of Willis usually surrounds the tumor. The hypophysis itself may be found intact or be pressed against the floor of the sella. The first five cranial nerves may early undergo a pressure atrophy, but the olfactory nerves usually escape. The foramen of Monro may be occluded, and internal hydrocephalus may result. The optic tracts are most seriously affected and may be spread out on the tumor like a ribbon. The sella is usually normal in size or only slightly enlarged. The tumors are usually the size of a pigeon or hen's egg when discovered. The majority are cystic; when solid they show areas of cystic degeneration. The author describes the histology in detail.

Of 17 cases in which the symptoms are clearly stated 12 were associated with adiposity and other symptoms of the Froelich syndrome, such as genital dystrophy and loss of body hair. In 26 cases, 19 had symptoms of failing vision and 15 of brain pressure. Optic atrophy was noted in 17 cases. The clinical course is varied; some cases reach the acute

stage in three or four weeks, others have symptoms for years.

No case reported has been associated with acromegaly.

In regard to diagnosis, roentgenoscopy is usually negative because the sella is rarely enlarged. The early disturbance of vision and one or more symptoms of the Froelich syndrome, especially adiposity, will suggest a tumor of the hypophyseal region; 70 per cent of these are craniopharyngeal duct tumors. The finding of a cyst at operation with the microscopic demonstration of stratified epithelium of the buccal type completes the diagnosis.

If drainage of the cyst type can be maintained, the patient can live for an indefinite length of time. If the cyst continues to enlarge, blindness usually results from pressure on the optic tracts or chiasm, and death follows in a few months or years from brain pressure. On the whole the outlook for this type of tumor is bad, as it is practically impossible to separate the cyst wall from the surrounding brain structures.

Three operations were performed by Kanavel by the transsphenoidal route, the nose being reflected upward. The anterior wall of the cyst was removed, together with some blood-stained fluid. The patient is still living one and a half years after the last operation, and there has been no return of symptoms to date. E. H. POOL.

Royce, C. E.: Sarcoma of the Base of the Skull. *J. Am. M. Ass.*, 1916, lxvi, 1288.

Reported cases of sarcoma of the bones of the base of the skull are not numerous. Of twenty sarcomata in this region, 60 per cent occupied the middle fossa. They rarely progress toward the brain but invade the bones and sometimes send processes into adjoining sinuses. Disturbances of the cranial nerves gradually appear, due to growth about the nerve-roots. Sarcomata tend to involve one side only; if bilateral they are almost always carcinoma or endothelioma; exceptionally bilateral growths may be fibrosarcoma or very malignant sarcoma. The author quotes Cantonnet's case of sarcoma of the sphenoid and reports a case of his own. In the latter there had been complaint of headache and disturbance of vision, ophthalmic examination showing optic neuritis with exudate. Decompression revealed nothing but increased intracranial pressure. At necropsy an encapsulated mass 9 cm. in diameter was found intimately connected with the periosteum covering the sphenoid bone. Section showed cells of a spindle-shaped type, mitotic figures not being numerous, and tumor-cells everywhere separated by a reticulum of connective tissue. E. K. ARMSTRONG.

Black, D.: Cerebellar Localization in the Light of Recent Research. *J. Lab. & Clin. Med.*, 1916, i, 467.

The author points out that the general theory of cerebellar localization as originally formulated by Bolk has been to a large extent confirmed not alone by experimental studies but also by careful clinical observation. Barany's localizations in the human cerebellar cortex remain yet to be confirmed in detail but the importance of his work in thus presenting a possible means of early diagnosis of cerebellar disease cannot be overestimated. Black further points out the contrast in the phenomena of motor localization characteristic of the cerebrum with those of the cerebellum and notes the fundamental differences between cerebral and cerebellar control. The cerebellar cortex has been shown to be practically inexcitable as compared with that of the cerebrum over the motor area.

He points out that muscular representation in the cerebral motor is chiefly determined by the segmental position of the respective muscles and, broadly speaking, more caudad muscles are represented in the upper portion of the motor area while the most cephalic groups are represented in the lowest areas of the precentral region. On the other hand in the cerebellum, while the grouping of the "tonus centers" has been determined in part by segmental position, their arrangement within the lobules has been chiefly determined by the functional association of muscular groups.

The cortex of the cerebellum is everywhere concerned in the elaboration of tonic, sthenic, and static impulses of a reinforcing nature distributed for the most part homolaterally. A special part only of the cerebral cortex is concerned in the elaboration of impulses of a voluntary, motor, clonic nature distributed heterolaterally.

Destruction of the motor cortex on one side of the cerebrum gives rise to an actual paralysis of a spastic nature in the musculature of the opposite side of the body, while destruction of the cortex on one side of the cerebellum causes no paralysis but gives rise to atonia, asthenia, and astasia of the musculature on the same side of the body. GEORGE E. BEILBY.

Amberg, E.: Conduction Anæsthesia in a Case of Brain Abscess. *Tr. Am. Otol. Soc.*, Washington, 1916, May.

The patient, 37 years old, had been ill for about ten days with severe pain. He had had a middle-ear suppuration on the left side for sixteen years. Various mental tests with a pencil, watch, keys, etc., showed that he recognized the objects but could not name them, and a diagnosis was made of intracranial complication of a chronic middle-ear suppuration.

The patient was removed to the hospital and a radical mastoid operation was performed and masses of cholesteatomatous material removed. Pus led the way upward and backward, and a small opening of the skull above and behind the external ear canal exposed a fresh pinkish-colored pachymeningitis. The patient was not benefited by the operation, and several days later an extensive opening was made adjacent to the small upper opening, about 1.5 inches backward, and about 0.25 to 1 inch wide, exposing also the lateral sinus. Introduction of the

brain knife through the area of pachymeningitis to a depth of 2 cm. failed to reveal anything of importance. The patient did not improve.

Four days later, the dura, which did not pulsate, was incised vertically about half an inch behind the area of pachymeningitis, and a Jackson brain-searcher introduced forward, upward, and inward, liberating about six drams of pus. There was no pulsation; no colon bacilli were found.

Two days later the brain-searcher was introduced backward, liberating about three drams of pus. There was no brain pulsation and not much improvement.

Several days later the process was repeated, the brain-searcher being introduced deeper and more forward, over one ounce of pus being liberated. The brain pulsated, and the patient's condition was improved.

Three days later more pus was liberated. Pulsation was good. The brain-searcher was directed to a point about 0.5 to 0.75 inch above the eyebrow, in the middle of the forehead and introduced to a depth of about 1.75 to 2 inches. About one ounce of foul smelling pus, with gas, was evacuated. A rubber drainage tube was introduced and there was a constant discharge. Fresh dressings were applied daily, the rubber tube being reintroduced, the length gradually being shortened for about five weeks, when the brain wound had entirely healed.

The patient's perception and recollection seemed to improve throughout the course of treatment. When shown objects such as a nail file, collar button, he could recognize them but was unable to name them readily. He could write better than he could read. He wrote rapidly but was unable to repeat the words he wrote.

XI–29–15. C. C. McClelland reports: Examination of fundus with "H. & C." drops, pupils dilated fully and equally in usual time. Left eye details of fundus easily seen. Nerve head indistinct on nasal side, more clearly defined on temporal side. Right fundus about same as left.

XI–20. Total leucocytes 20,900; polynuclear 88.4 per cent; blood-culture negative.

XI–23 White 14,932; polynuclear 79 per cent
XI–25 Total white 14,100; polynuclear 79 per cent
XI–26 Total white 13,240; polynuclear 75 per cent
XI–27 Total white 10,666; polynuclear 71.6 per cent
XI–29 Total white 11,000; polynuclear 71.1 per cent
XI– 7 Total white 12,000; polynuclear 68.5 per cent
XI–23 Cells in spinal fluid 172 per ccm.; no organisms.

When heard from three months later, the patient stated that he felt very well but that he tired out quickly and that he sometimes had headaches and dull pain in his head when he worked too hard.

Cope, V. Z.: The Pituitary Fossa and the Surgical Methods of Approaching It. *Lancet*, Lond., 1916, cxc, 601.

A pituitary body is present in all vertebrates, but only in mammals is there a specialized protection afforded by the skeleton. In the human embryo the fossa is formed at an early stage, a recess being observable in an embryo of 28 mm. The current statement that the craniopharyngeal canal lies between the pre- and post-sphenoid is incorrect. The canal traverses the anterior part of the post-sphenoid. Radiograms of the sellæ of children show that there is normally great variation in size, and that there is no particular age at which special increase in size occurs.

The size of the pituitary fossa varies, but roughly it is 11 mm. long and broad and 6 mm. deep. The sella is lined by dura mater and roofed in by the diaphragma sellæ, so that the gland is hemmed in by a cuboidal box, three sides of which are bone and three sides fibrous. The sphenoidal sinus enlarges somewhere between the seventh and the fourteenth year until the whole of the presphenoidal area is excavated, at which point the excavation may stop, but it commonly proceeds back into the basisphenoid. In the former type the pituitary fossa causes no bulge into the sinus, while in the post-sphenoidal type the bulge is always present.

The fossa is surrounded by a venous and surmounted by an arterial circle, the circle of Willis. The venous circle is formed by the two cavernous and the anterior and posterior intercavernous sinuses. A pituitary growth ascending from the fossa enters the arterial circle, pushing up the optic chiasma until the optic nerves are gradually strangled between the neoplasm and the arteries.

Abnormal fossæ may be classed as enlarged, reduced, and deformed. Enlarged sellæ may be due to adenomatous overgrowth of the anterior part of the gland, to malignant neoplasm originating in the fossa, possibly to repeated physiological enlargement due to increased functional activity, and more rarely to a general or local hydrocephalus, chronic circumscribed meningitis, or to tumors of other parts of the brain. Very small fossæ are seen in cases of hypopituitarism associated with imperfect development of the gland. The fossa may be deformed by tumors bursting from within or by interpeduncular neoplasms pressing down from above. In the former the nature of the deformity would depend upon the rate of growth, producing a thinning, a cup-shaped outline, or banishment of all traces of the original shape. If the dorsum sellæ or anterior or posterior clinoid processes are obliterated or markedly eroded, there must be a large intracranial extension to the tumor.

The pituitary fossa has been arrived at either directly through the cranium or indirectly through the facial skeleton, the following table showing the routes which may be utilized:

CRANIAL

Temporal —
  Intradural (Horsley).
Temporal —
  Extradural (Braun).
Frontal (Krause).
Fronto-orbital (Frazier).
Callosal puncture.

FACIAL

Nasal —
Septal resection (Schloffer, Hirsch, West, Cushing, Kanavel, Halstead, etc.).

Nasal —
Ethmoid resection (Hirsch).
Paranasal (Chiari, Kahler).
Palatal (Koenig, Preysing).
Maxillary.
Suprahyoid pharyngotomy.

Of these operations only four have been done in a sufficiently large number of cases to merit special attention.

Horsley's temporal method is done in two stages. A temporal bone-flap is made in the first stage, and in the second, the dura is incised and the temporal lobe lifted up, exposing the lateral aspect of the pituitary body. In Schloffer's method approach is gained to the nasal cavity either directly through the anterior nares, or by reflecting the nose, or by a sublabial incision. Varying portions of the septum and lateral walls of the nasal fossa are removed to furnish more room; the sphenoidal sinus is opened and through it the pituitary fossa is approached. Hirsch and Cushing do a most ingenious submucous septal approach, Cushing removing the vomer, part of the median plate of the ethmoid, and a strip of septum. The attachment of the septum to the sphenoid being exposed, the anterior and lower walls of the sinuses are chipped away and the floor of the exposed sella turcica removed. Hirsch removes the middle turbinates some days before the chief operation. The fronto-orbital method of Frazier is begun by forming an osteoplastic flap in the frontal region; the roof of the orbit is removed as far back as the optic foramen; the orbital contents are displaced downward and outward; the frontal lobe is elevated and the dura incised for a sufficient length to expose the contents of the sella. Other operations have rarely been performed.

The nasal route of Schloffer is fundamentally unsound, as are all of its modifications, excepting the submucous, as the sella is approached through a region teeming with organisms or harboring foci of infection in adjacent sinuses. Considerable deformity of the external nose may follow also. The same objections hold against the palatal method which traverses the septic post-nasal space and also against the Chiari-Kahler approach through the ethmoid by external incision. Though Kahler has had some success with it it is too early to say much in its favor. The temporal method has been found practicable by one operator only, but with a considerable mortality.

The only justifiable method of approach through the sphenoidal sinuses is that of Cushing or Hirsch, especially that of Cushing. Of 32 operations performed by the sublabial method by the latter operator, but one death occurred. With this method special skill in working in such a confined space is necessary as the surgeon cannot see what relationship his inserted spoon bears to the third ventricle. On several occasions it has been necessary to insert a metal clip for radiographic orientation purposes. A preliminary sounding of the sphenoidal sinuses is wise before undertaking this operation.

Facts in favor of the fronto-orbital method are that it provides an aseptic route, allows each step to be performed by the aid of sight, and does not necessitate much dislocation of the brain as with the temporal method.

The most common indication for operation is oncoming blindness and it seems certain that in nearly all these cases there must be considerable intracranial extension. With the fronto-orbital method these enlarged glands present an easier object for attack. Some œdema of the eye occurs after operation and sometimes the eyeball may not be left quite on the same level as the opposite one. The latter drawback should be avoided by greater care at the time of operation. The frontal sinus is sometimes in the way, but by previous X-ray or transillumination it can be avoided.

While it is not possible to say which of the Hirsch-Cushing or fronto-orbital methods is to be preferred, the author believes that the latter is more suitable in the majority of cases.

E. K. Armstrong.

NECK

Watson, L. F.: Quinine and Urea Injections in Hyperthyroidism. *N. Y. M. J.*, 1916, ciii, 791.

The author briefly reviews some of the methods of recent years that have been instituted with the idea of controlling the hyperactivity of the thyroid gland. He emphasizes the necessity of rest, with proper dietetic and hygienic supervision, as the foundation for any procedure in the treatment of hyperthyroidism and urges that the other ductless glands as well as the thyroid in each patient be studied; their rôle in contributing to the symptoms ascertained and treated accordingly.

The author recommends quinine and urea injections to relieve hyperthyroidism only, and not to remove the goiter; however, small, recent goiters usually disappear following the treatment. Much depends upon a proper selection of cases. The technique is difficult and the method is suitable for use only in a hospital by men experienced in thyroid surgery.

The author describes an original method of raising the hyperthyroid patient's threshold to stimuli, by means of preliminary injections into the thyroid gland of a few minims of a sterile salt solution, followed by injections of sterile water, given at one- to three-day intervals. When no hyperthyroidal reaction follows the water injections their usefulness is at an end. If these preliminary injections are omitted, acute attacks of hyperthyroidism which might result disastrously are liable to

follow. It is important that the slight pain of the injection be minimized by the use of local anæsthesia. It is important that the patient does not come to dread the injections because the best results are secured through prolonged periods of treatment.

E. H. Pool.

Marsh, M. C., and Von Willer, P.: Thyroid Tumor in the Sea Bass (Serranus). *J. Cancer Research*, 1916, i, 183.

The authors' contribution to the pathology of enlargements of the thyroid in fish is based upon five cases of thyroid enlargement observed in serranus (sea bass). The authors state that although thyroid tumors have long been known to occur in fish, they have not been observed until recently outside the salmonoid group, and only rarely outside of domesticated fish, where they are endemic and widespread.

The only case known to have occurred in fish from marine waters, besides the present specimens, is the case described by Cameron and Vincent. This was in a small shark of the genus squalus, of the Pacific coast of North America.

The authors report that of the five tumors, one specimen was plainly colloid goiter; one was microscopically a step in advance toward epithelial increase of large alveolar type and shrinkage of the colloid content. In another the epithelial outgrowth was predominant over the colloid, the cells having become high columnar, and the growth having taken on a definite adenomatous structure. In one case marked regression was indicated.

The growth in these specimens of serranus is not regarded as giving pronounced evidence of malignancy. Little infiltration is exhibited throughout the growth as a whole. In this respect the growths do not approach the process as exemplified in the fresh water salmonoids or in the case of squalus. The bodies of the fish were not examined for metastases. The authors believe the tumors to be true neoplasms representing early stages of processes which are of essentially the same nature as the other thyroid overgrowths in fish which have been the subject of investigation.

The authors call attention to the fact that iodine acting through the water medium, even in great dilution, has a marked action upon thyroid hyperplasia or more advanced overgrowth in fresh water fish, reducing the heightened epithelium, restoring colloid, and effecting regressive changes in general. They claim that their specimens are of additional importance from the fact that the fish were removed from the sea to an aquarium supplied with sea-water, and were habitually fed with marine fish, chiefly the pilchard (*clupea pilchardus*). They received no mammalian tissues. They acquired the growths in sea-water, which contains a far greater concentration of iodine than that which is effective in reducing thyroid hyperplasia in fresh water fish.

E. H. Pool.

Gaylord, H. R.: Further Observations on So-called Carcinoma of the Thyroid in Fish. *J. Cancer Research*, 1916, i, 197.

The author reviews the literature of the so-called carcinoma of the thyroid in the salmonoids.

The disease was first described by Bonnet in 1883. Although this author did not recognize its nature, Scott in 1891 regarded it as cancer, and Plehn in 1902 recognized it as a neoplasm of the thyroid gland. In the same year it was described by Gilruth as epithelioma affecting the branchial arches. A comprehensive histological study based on some ten specimens of fish was made by Pick in 1905. The author's contributions to this subject date from 1908, with the description of conditions existing in a hatchery in which hundreds of fish were affected. The disease has been studied also by Marine and Lenhart, beginning in 1909, and they consider it to be endemic goiter. Gaylord's studies were published in monograph form in 1914, and led to the conclusions regarding the nature, distribution, and significance of the disease which are summarized in this article. Gaylord emphasizes the fact that the disease is endemic in a very high percentage of all trout hatcheries in the United States. He states that the occurrence of the disease in wild fish, its production in fish cultural stations, its localization in certain troughs of water supplies, the method of its spread, its transmission to mammals, the efficacy of three well known inorganic germicides in the treatment of the disease, the destruction of the agent by boiling, and the phenomena of spontaneous recovery and immunity strongly indicate that the agent causing the disease is a living organism.

Gaylord states that as there is no line of demarcation between what is called endemic goiter and what may be considered as cancer of the thyroid, endemic goiter and carcinoma of the thyroid in the salmonoid are identical.

The cases found in sea bass by Marsh and von Willer, the thyroid tumor found in squalus, or small shark, by Cameron and Vincent, together with the evidence which has been collected regarding the existence of thyroid carcinoma in fish living under natural conditions, and hence unaffected by overfeeding, overcrowding, etc., strengthen the conclusion that the disease is not the result of artificial propagation. The occurrence of the disease in sea fish bears rather strongly upon that theory of thyroid hyperplasia which attributes it to a deficiency of iodine in the food or environment. In fact, so far as fish are concerned, the similar results obtained with mercury and arsenic would seem to show conclusively that iodine acts in a manner similar to the metals, and not by supplying a deficiency of iodine in the gland.

The observation that mercury, arsenic, and iodine, when introduced even in small amounts into the water containing fish with thyroid tumors, bring about a marked diminution in the size of the neoplasm, develops increased significance in the light of recent experiments reported by McCarrison.

In discussing the question whether the iodine acted as a purifier of the water, especially as a germicide, or whether its effect was to be attributed to its supposed physiological influence upon the thyroid gland, McCarrison stated that he had obtained equally favorable results in the treatment of goiter with thymol; hence he was not inclined to attribute to iodine a distinctly physiological action in the treatment of goiter.

McCarrison's experiments do not show conclusively that the iodine worked by destroying an agent in the water supply, for the possibility still remains that it may have exerted some germicidal effect in the individual drinking the water. It is to be regretted, therefore, that he did not entirely substitute chlorination of the water for treatment with iodine. E. H. POOL.

Little, E. G.: Sclerodermia Associated with Graves' Disease, and Later Myxœdema, Conspicuously Benefited by Implantation of Human Thyroid into the Bone-Marrow. *Proc. Roy. Soc. Med.*, 1916, ix, *Dermatol. Sect.*, 69.

The case is described of a lady, aged 52, who in 1902 presented the symptoms of Graves' disease to a mild extent. In 1908 she developed myxœdema. Her pulse-rate, however, still continued to be 120 and her blood indicated marked anæmia. Periods of irregular fever with urticarial swellings, as well as pains in the shoulder and neck, bothered her so much that she had to be carried in a chair. The sclerodermia became evident in 1910, affecting chiefly the fingers, forearm, face, and thighs. The stiffness became so extensive that she was greatly crippled. The mental accompaniments of myxœdema, dullness and lethargy, were conspicuously absent.

Implantation of thyroid was made into the tibia in 1911. Following this the sclerodemia was much improved. She was taking iodothyrine at this time. In 1912 a second implantation of thyroid tissue was made. In 1913, pyorrhœa alveolarus was diagnosed. After having all her teeth removed. there followed a remarkable change in her general health and appearance, an improvement which has been steadily maintained. At present the fingers have become flexible enough to permit her to play the piano. The skin of the face is supple and otherwise normal. H. G. SLOAN.

Gronnerud, P.: The Technique of the Enucleation Thyroidectomy. *Illinois M. J.*, 1916, xxix, 259.

This operation will be found practically applicable to all parenchymatous goiters, whether of the cystic, colloid, fibrous, or mixed variety, but should never be attempted under the vascular or active hyperplastic enlargements. It is a method very largely eliminating the use of clamps and accompanied by a minimum loss of blood, never followed by nerve complications, and when even mediocre surgical judgment is available, of extreme breadth in application.

The usual low skin incision is made. The fascia is raised slightly and cut parallel to the contained veins and the cleavage line between the revealed edges of the sternothyroid and sternohyoid muscles observed. These muscles are separated and retracted, revealing the encapsulating fascia of the gland. It will thereupon appear that the true capsule of this organ blends with the so-called Kocher fascia and is very rich in arteries and veins. When the anterior fascia, which is comparatively free from large vessels, is opened the thyroid capsule will be seen. No clamps are used in these procedures, hæmorrhage so far being slight and automatically ceasing on the correct separation of the tissue layers. The true capsule is then opened into and, by posterior pressure, the tumor delivered. The tumor may be enucleated without difficulty, leaving a comparatively bloodless bed which depicts the arrangement of vessels in the true capsule.

In 98 thyroidectomies in which the above technique was followed, the application of clamps to the inferior thyroid artery was necessary in two cases, but, being inside the capsule, no injury to the nerve was possible; necessity for clamping the superior thyroid artery did not arise. EDWARD L. CORNELL.

Petersen, W., Jobling, J. W., and Eggstein, A. A.: Serum Changes Following Thyroparathyroidectomy. *J. Exp. Med.*, 1916, xxiii, 499.

The experiments here recorded were made on dogs. Thyroparathyroidectomy was performed in fifteen animals, and the serum changes were studied. The following two experiments were typical of the relations noted.

On the first dog, weighing 5 kilos, complete thyroparathyroidectomy was performed June 1, 1915. Tetany was observed on the third day following the operation; on the fourth day the dog showed no symptoms; but on the next day (June 5) there was marked tetany. The animal was found dead the following morning.

On the second dog, weighing 8 kilos, complete thyroparathyroidectomy was performed June 8, 1915. Tetany was noted on the afternoon of June 10th, again on the following afternoon, and the next morning (June 12) when the animal was killed.

In the first dog there was a gradual increase in the antiferment titer until the time of death, with an irregular protease curve. The maximum protease activity was noted in the animal during the time when the tetany was most apparent. The noncoagulable nitrogen of the serum increased to more than twice the original amount. The lipase remained constantly low. The proteoses increased markedly. The amino-nitrogen of the serum in this animal showed no change except an initial decrease.

In the second experiment the conditions were different. The antiferment titer showed marked fluctuation, the first decline appearing shortly after the operation. The protease remained low

until the last day, but the non-coagulable nitrogen increased as in the previous animal; the proteoses also accumulated during the period of tetany. The increase in amino-acids was similar to that observed in practically all the other animals during tetany. This was the only animal of the entire series in which a rise in the lipase titer was observed.

From their study the authors draw the following conclusions:

1. In thyroparathyroidectomized dogs the onset of tetany bore no constant relation to the ferment-antiferment balance of the serum.

2. The serum lipase titer remained at a low level throughout.

3. A progressive increase in non-coagulable nitrogen and proteoses was observed in the serum following the removal of the glands.

4. The amino-nitrogen of the serum was usually increased at the time when tetany was most marked.

GEORGE E. BEILBY.

SURGERY OF THE CHEST

CHEST WALL AND BREAST

Menzies, J. L.: Notes on a Series of Seventy-five Gunshot Wounds of the Chest. *Brit. J. Surg.*, 1916, iii, 667.

The statistics of a series of 75 cases of gunshot wounds of the chest are reported by the author, and 12 of the more interesting cases are described in detail.

The most notable feature of the series is the rapid recovery where there was no destruction of the chest wall, as compared to the high mortality in cases with open wounds. Where the pleural cavity communicated with the outer air the results were almost uniformly fatal.

The symptoms are pain, shock, dyspnœa, and hæmoptysis, and are due to damaged lung tissue and the resulting escape of blood and air into the pleural cavity. Pain is always present but is rarely severe. On the other hand, shock is usually pronounced. Dyspnœa is almost always present and is most severe immediately following the wound, abating within twelve to twenty-four hours.

Hæmoptysis occurs in the majority of cases, seldom, however, being severe and lasting only two or three days. In the series, 27 had no bleeding; in 40 it came on immediately after injury, and in 8 it was delayed from one to twelve hours. In all cases there was a rise of temperature.

In the base hospital dyspnœa and pyrexia are the prominent symptoms, depending on the presence of an effusion and whether it is sterile or septic, the amount of effusion determining the degree of dyspnœa. In the series, effusion took place in 70; 49 were sterile; 10 showed slight infection and 11 marked infection.

Pneumothorax was present in 14 of the cases; in 8 it communicated with the outer air. Surgical emphysema was present in 12, and required no treatment. Twenty-seven cases were discharged as cured, with the missile retained but causing no symptoms.

The cases were divided into those with wounds which were healing or healed and those with wounds opening into the pleural cavity at admission. There were 67 cases in the first class and 8 in the second. Those of the first class were much more favorable for treatment: 66 recovered and 1 died of sepsis. The majority of effusions were bacteriologically sterile.

In the second class there was marked destruction of the chest wall; all were infected (pyohæmopneumothorax) and the mortality was very high. Of 8 cases, 7 died. Autopsies showed extensive laceration of the lung with lung abscesses spreading from the track of the bullet.

In the entire series, 67 recovered and 8 died, the deaths being due to sepsis.

In the treatment, rest is paramount, morphia being used as needed.

When the effusion is found to be sterile it may or may not be removed, depending upon the case. If left alone recovery is prolonged.

If the effusion is infected, early drainage is indicated, resection of a portion of a rib with a large drainage tube giving the best results. With a large empyema cavity the prognosis is grave.

Early rising with general and breathing exercises was found most beneficial. P. M. CHASE.

Newbolt, G. P.: Clinical Lecture on Cancer of the Breast. *Med. Press & Circ.*, 1916, ci, 326.

In the author's opinion, three reasons still militate against cancer of the breast: (1) bad advice of the family physician; (2) failure of the patients to report the presence of the tumor; (3) disinclination on the part of the patients to have the radical operation done. Another factor which influences the laity to believe that the tumor is not cancer is the fact that it is not painful.

The author lays stress on the fact that the nipple need not necessarily be retracted in cancer of the breast. He thinks that where the supraclavicular glands are involved, the outlook is extremely grave, and the prospect for cure quite remote. The prognosis usually depends upon the stage of the growth at which removal is undertaken, as well as the age of the patient. The prognosis in young and healthy persons is bad. The best results are in women over 50. In males the outlook is extremely poor. Attention is called to the frequency with which metastasis occurs in the opposite breast, sternum, spine, and hip. H. G. SLOAN.

Gatewood: Tuberculosis of the Mammary Gland. *Interst. M. J.*, 1916, xxiii, 272.

The author credits Astley Cooper with having described the condition in 1829. Dubar in 1881 first described the disease microscopically. Deaver collected 94 cases which were reported between 1914 and 1915, and Durante collected 150 cases in 1914.

Tuberculosis of the breast has been classified into primary and secondary groups, the primary group comprising only those cases in which the disease was limited clinically to the breast and the glands of the axilla of that side. Since no post-mortem has been made in which the condition was so localized, Gatewood is of the opinion that "all cases of tuberculosis of the breast are but secondary manifestations of tuberculosis elsewhere."

In the majority of cases the bacillus reaches the breast through lymph channels, probably a "retrograde embolic process." The disease usually occurs in the female breast. No cases have been observed before puberty, cases usually occurring between the ages of 30 and 50. The most frequent initial lesion is a painless lump in the breast. Any patient presenting a lump in the breast and complaining of pain in the region of the tumor on deep inspiration should be radiographed for tuberculosis of the ribs.

The progress of the disease is usually rapid. One breast is involved as a rule. The lymph-nodes are enlarged in from 60 to 70 per cent of the cases.

Fistulæ, retraction of the nipple, and enlarged lymph-glands on the affected side are the most constant physical findings of the disease. The majority of the cases present tumors; they may be discrete, disseminated, or become confluent. The consistency varies with the amount of liquefaction and caseation. The skin becomes adherent to the mass and assumes a dark red appearance; this is followed by a rupture, discharge of caseous material, and sinus formation.

Tuberculosis of the breast must be differentiated from syphilis and actinomycosis. Potassium iodide is almost specific for both.

The treatment of tubercular mastitis is surgical. The after-care is important. The use of tuberculin is of questionable value. ISIDORE COHN.

Robinson, S.: Treatment of Chronic Non-tuberculous Empyema. *Surg., Gynec. & Obst.*, 1916, xxii, 557.

Three types of cases are mentioned: (1) those with an operative drainage wound; (2) those with leakage through a *necessitatis* opening; (3) those with bronchial drainage. Several types of cavities are described and illustrated: lateral cavities, small and large, anterior cavities, posterior cavities, cavities in the upper thoracic segment, multiple cavities designated as generally fatal. A preliminary drainage operation regardless of previous openings is imperative at least six weeks previous to any operation for cavity obliteration. Operations for obliteration should be without mortality. The Estlander, Schede, Wilms, Delorme-Fowler, and Sudek methods all possess advantages and also sources of error.

Muscle-implantation may be employed in cavities of moderate size, utilizing the latissimus dorsi muscle dissected from the Schede U-shaped flap. The operation is preferable to those requiring partial resection of the scapula, described by Sudek and others, the latter producing limitation of shoulder motion.

Another operation is described involving the infolding of lateral skin and muscle-flaps with exposure of the entire cavity for subsequent skin-grafting, or stimulation of granulations and epithelialization. Surgical success depends upon the choice of a single method or a combination of methods applied with accurate knowledge of the extent and location of the cavity, and with conservatism in the number of operative stages. The non-operative treatment of chronic empyema, such as vaccine-therapy and antiseptic injections, produce symptomatic relief, and a diminution in the discharge, but the relief is more apparent than real. These treatments are frequently misapplied and generally serve unnecessarily to postpone obviously indicated surgical therapy. Bismuth and vaseline injections (Beck's paste) are of definite curative value in cavities primarily small or reduced to suitable dimensions by operations.

Ewing, J.: The Thymus and Its Tumors; Report of Three Cases of Thymoma. *Surg., Gynec. & Obst.*, 1916, xxii, 461.

The thymus reticulum is composed of modified epithelial cells, while the parenchyma cells are lymphocytes which have wandered into the stroma from without. The evidence indicating the dermatosis of thymus parenchyma cells from the epithelial stroma is unsatisfactory.

General pathological conditions affecting the thymus include aberrancy of thymus tissue in thyroid; simple hyperplasia in status lymphaticus, Graves' disease, and simple lymphadenoma; exfoliation of reticulum cells in leukæmia and infections; cysts; and neoplasms. Cysts arise from persistent embryonal epithelial canals, from branchial and ventral ectoderm, from distended softened Hassall's corpuscles, and from lymphangiomata.

Neoplasms include round-cell growths, commonly classed as lymphosarcoma, and tumors composed of flat or cylindrical epithelium. There are rare myxosarcomata of congenital origin, but malignant tumors arising from the connective tissue probably do not occur.

The so-called round-cell tumors, properly called thymomata, are derived from the epithelial stroma cells, and may be distinguished from true lymphocytomata of lymph-nodes. The cells are not round lymphocytes but polyhedral, or cylindrical, or giant derivatives of the stroma cells. The same variations in structure are observed as in Hodgkin's

granuloma and reticulum-cell sarcoma of lymph-nodes. The clinical course of these tumors also varies from the character of a progressive granuloma to that of a highly malignant locally aggressive neoplasm which may produce widespread extensions and metastases. A notable feature is perforation of the chest wall. The anatomical position and peculiar structure usually permits a satisfactory diagnosis. Thymic carcinoma includes those tumors composed of pavement, cubical, or cylindrical epithelium, but there is no sharp dividing line between the two groups, and both arise from the reticulum cells. The parallel existing between thymic granuloma and thymoma on the one hand, and lymphatic Hodgkin's disease and reticulum-cell sarcoma on the other, suggests that in both organs an infectious agent initiates an infectious process which often runs into a neoplasm. Most reported cases of the transformation of Hodgkin's disease into sarcoma relate to mediastinal and probably thymic tumors.

The reported cases include a rapidly progressive febrile case with very extensive invasion of the neck, chest, and axillæ by a tumor of diffuse structure; a perforating sternal tumor of two years' progress, structurally resembling Hodgkin's granuloma, regressing under X-ray; and a slowly progressive thymoma of granulomatous type, limited to the mediastinum, and showing polyhedral reticulum cells and Hassall's corpuscles.

TRACHEA AND LUNGS

Moore, A. B., and Carman, R. D.: Radiographic Diagnosis of Metastatic Pulmonary Malignancy. *Am. J. Roentgenol.*, 1916, iii, 126.

The authors give a report based on 71 positive cases examined at the Mayo Clinic by both clinical and radiographic methods.

LOCATION OF PRIMARY FOCUS IN CASES SHOWING RADIOGRAPHIC EVIDENCE OF METASTASES IN THE LUNGS

	No. Cases
Total number tabulated	71
Breast	20
Thyroid	8
Kidney	5
Soft tissues of forearm and shoulder	6
Soft tissues of leg and thigh	6
Soft tissues of neck and face	5
Uterus	2
Œsophagus	2
Prostate	2
Testicle	2
Hard palate	1
Larynx	1
Sigmoid	1
Adrenal	1
Lung	1
Abdominal and pelvic masses	4
Origin not determined	4

Men	32
Women	39
Average age	45.5 years
Average time since growth was noticed	2.25 years
Histologic examination	59 cases
Carcinomata	40 cases
Sarcomata	16 cases
Hypernephromata	3 cases
Enlargement of superficial glands	35 cases
Enlargement of deep glands	8 cases
Other foci of metastasis	14 cases

Apparently no idea as to the presence of pulmonary metastasis can be gained from the extent of the primary growth. Many cases with extensive involvement showed no metastasis, while in many the primary growth was small and clearly operable except for the radiologic evidence of metastasis.

Fourteen of these cases showed metastasis in organs other than the lungs or lymph-nodes. The other organs most frequently involved were the liver, bones, and brain.

Of the patients operated on, 42 had been subjected to surgical procedure for the removal of the primary growth; of these, 19 showed local recurrence. The average time from the operation to the discovery of the metastasis was 15 months.

Cough was present in 32 cases. It was usually dry, hacking, and unproductive, expectoration having been noted in but 8 cases. Only 4 gave any history of blood-spitting. The so-called prune-juice sputum, regarded by some observers as indicative of this condition, was not observed.

Dyspnœa occurred in 30 cases. It was usually progressive and, when marked, tended to be spasmodic in character, quite often simulating asthma.

Pain referred to the thorax was noted in 14 instances, usually described as gnawing and not influenced by respiration.

There was both clinical and radiographic evidence of pleural effusion in 12 of the cases.

A very striking feature was the relative absence of definite physical findings.

The conclusions are:

1. Pulmonary metastatic malignancy is not an uncommon condition and may occur regardless of the seat of primary focus.

2. Pulmonary metastasis bears no relationship to the extent or duration of the primary focus.

3. The clinical picture in a majority of these cases is very indefinite, neither the subjective nor the objective manifestations being characteristic.

4. Metastatic pulmonary malignancy is a definite roentgenographic entity, appearing in the roentgenogram as clear-cut circumscribed areas of increased density.

5. In many instances the diagnosis can be established only by the roentgenogram. By routine roentgenographic examination of the thorax many patients suffering from malignancy will be saved from useless and unwarranted surgery.

DAVID R. BOWEN.

PHARYNX AND ŒSOPHAGUS

Hirsch, I. S.: The Roentgen-Ray Study of the Œsophagus. *Interst. M. J.*, 1916, xxiii, 42.

Hirsch's paper is comprehensive. For a contrast mixture he uses a tablespoonful of bismuth subcarbonate (or subnitrate) stirred for about ten minutes with a teaspoonful of mucilage of acacia. The resulting mass is viscous, and by coating the walls of the œsophagus outlines its lumen. The examination is essentially fluoroscopic, but plates are also made. The oblique view, either dorsoventral or ventrodorsal, is emphasized. Two periods in the act of swallowing, the buccopharyngeal and the œsophageal, may be differentiated. The bolus is propelled by the pharynx into the œsophagus with great force and rapidity. It is carried through the œsophagus by peristalsis. Solid food is carried down solely by peristalsis, while liquids are ejected from the pharyngo-œsophageal junction (introitus) to the cardia. The wave is deepest in the lower œsophagus where it is necessary to overcome the sphincteric action at the cardia.

Foreign bodies are most frequently impacted at four points: opposite the cricoid cartilage; above the arch of the aorta; at the crossing of the left bronchus; and at the diaphragm

Two great classes of spasm may be differentiated: the primary, so-called idiopathic spasm, the etiology of which is not clearly understood; and the secondary spasm, the reflex of irritation, inflammation, or ulceration. The former affects the lower end of the gullet, and leads to dilatation; the secondary spasm may involve any part of the lumen. Spasm is indicated by the arrest of the bismuth in a cone-shaped shadow at the constricted point. In the primary cases with dilatation there may be rapid, deep peristaltic waves moving to the base, with occasional regurgitation. The outline is smooth and symmetrical above the point of obstruction.

Benign, or scar stenosis is usually asymmetrically situated, while the extent of the stenotic area is short. Stenosis due to corrosives is most frequently found either at the pharyngeal mouth or in the upper dorsal part of the tube.

The commonest form of stenosis is that due to carcinoma. At least 70 per cent of patients complaining of dysphagia have this disease of the gullet. As a rule these tumors involve but a part of the surface of the tube; rarely do they involve its entire circumference. This accounts for the irregular, asymmetrical filling defect. Dilatation above it is never marked. Peristalsis is absent over the invaded area and distal to it.

Syphilis of the œsophagus resembles cancer roentgenologically, excepting in regard to the multiplicity of the lesions.

Diverticula are of two varieties, pulsion and traction. The former are most common, are situated high, near the introitus, and appear as pouch-like adjuncts to the œsophageal lumen.

ALBERT MILLER.

Moore, I.: The Removal of Foreign Bodies from the Œsophagus and Bronchi; with a Description of Some New Instruments. *Lancet*, Lond., 1916, cxc, 992.

The author has designed a new non-slipping forceps for removing foreign bodies of any description. The blades are shaped on the principle of a crab's claw, the upper blade being curved and having at its extremity a triangle tooth which fits between two similar ones in the lower blade. Both blades are transversely serrated, giving greater security to their hold on a foreign body. They are in addition grooved down the center so as to prevent any lateral slipping. He has also devised an endoscopic cutting forceps or shears which combines both the grasping action of forceps and the cutting action of shears.

OTTO M. ROTT.

SURGERY OF THE ABDOMEN

ABDOMINAL WALL AND PERITONEUM

Sampson, H. H.: Clinical Notes on Penetrating Wounds of the Abdomen. *Brit. M. J.*, 1916, i, 547.

The extent of the visceral injury caused by rifle bullet in the abdomen depends to a large extent on the distance the bullet has traveled before the impact. The most extensive wounds are caused when the range is less than five hundred yards.

The importance of primary hæmorrhage lies in the fact that there is little tendency toward spontaneous arrest. When seen three or four hours after the receipt of the injury small arteries in the wounded bowel are still spurting vigorously. In fatal cases death is almost invariably due to primary hæmorrhage. It becomes obvious, therefore, that on this account alone, every effort should be made to convey the abdominal wounds with the least possible delay to a place which is equipped for operative treatment.

One case is reported in which a bullet traversed the peritoneal cavity in an area occupied by intestines without causing perforation of the viscera, with which it must have come in contact.

Wounds of the small intestine are generally multiple but are usually confined to one segment of the bowel. Wounds of the colon are often complicated by injuries to other viscera. These cases show a high mortality. If, however, the injury is confined to the colon, the outlook is more hopeful, provided operation is performed before a widespread peritoneal infection has occurred.

Wounds of the stomach bleed freely, but if uncomplicated respond well to operative treatment. Wounds of the liver give the best results. In simple perforations, hæmorrhage is slight; bile drains away for a few days; recovery is the rule.

The spleen is seldom injured alone. Its injury is often associated with that of the left kidney, pleura, and lung. J. H. SKILES.

Fraser, J., and Bates, H. T.: Penetrating Wounds of the Abdomen. *Brit. M. J.*, 1916, i, 509.

The authors report the operative results in penetrating wounds of the abdomen and discuss their observations in these cases.

In wounds of the stomach the degree of damage depends on the nature of the projectile and the part of the stomach injured. Shell fragments produce the most extensive destruction, while bullets generally behave as in other soft tissues, i.e., small entrance wound and larger exit wound. Bullet wounds of the center of the stomach produce the least destruction, those of the pylorus quite extensive laceration, while those of the greater or lesser curvatures are accompanied by widespread splitting and tearing of the tissues. Hæmorrhage is not severe unless one of the larger vessels is ruptured.

Clinically, this class of cases shows pain, sickness, collapse, abdominal rigidity and tenderness; the sickness being more pronounced than is usual, and the collapse less marked. The pulse and respiration rates are increased; the latter proportionately more rapidly than the former. Pain is more pronounced when the pyloric or cardiac ends are involved and collapse more marked in wounds of the curvatures.

In the operative treatment the authors employ a left rectus incision, occasionally enlarging it laterally. When the situation of the wound is doubtful an incision parallel to the left costal margin is used. After rigid inspection one of three lines of treatment is instituted: (1) simple suture, (2) gastro-enterostomy, or (3) pylorectomy with partial resection depending on the conditions found.

Six illustrative cases are described, 3 of which died, 2 recovered, and one was unoperated. Suture was used in 3 cases, gastro-enterostomy in one, and resection in one.

Bomb fragments wounding the small intestine cause small multiple wounds with invaginated edges and a marked tendency to surrounding hæmorrhage. Bullets traveling at high velocity cause small equally sized perforations; at low velocity they cause considerable destruction of tissue. Wounds by shell fragments are usually quite extensive. Wounds of the free edge of the gut involve more tissue destruction than those of the fixed or mesenteric border.

Bleeding from the small intestine is usually severe, especially in the jejunum, and mesenteric hæmorrhage is always progressive. It was also observed that the less the damage to the gut the more likelihood there was of extensive peritoneal soiling. Massive injuries inhibit peristalsis.

Bullet wounds of the buttocks, it was noted, are liable to be followed by evidences of injury to abdominal viscera.

Clinically these cases show signs of beginning peritonitis coupled with those of hæmorrhage, the symptoms of bleeding coming on first, followed by those of peritonitis. The abdominal rigidity when bleeding is profuse, often disappears.

The author advocates the midline incision and a complete inspection of the entire small gut before deciding upon the best method of procedure. The various methods are: (1) simple suture; (2) resection followed by lateral or end-to-end anastomosis; (3) resection and temporary enterostomy.

With simple suture it was found essential that the wound be small, edges undamaged, and mesentery intact. Wounds by bomb fragments are ideal for suture. The wound edges were not excised and linen thread was used.

The indications for resection and anastomosis are: numerous perforations, extensive size and degree of injuries and involvement of related mesentery. This procedure is highly favored by the authors. They also prefer the lateral anastomosis as being less likely to be followed by paresis and distention of the proximal segment.

Resection and enterostomy are only indicated as an emergency measure in rapidly developing collapse during operation.

A synopsis is given of 21 illustrative cases: 12 died, 7 recovered and 2 were unoperated. Suture was done in 5, resection in 13, and enterostomy in one.

In wounds of the colon the effects of the different projectiles are similar to those in the small gut, with the exception that the septic material is much more likely to be walled off by adhesions. Peritonitis from such wounds, however, is intensely virulent.

Clinically the symptoms are likewise similar to those of wounds of the small intestine except in not being so widespread and with an absence of early sickness or nausea.

In the treatment, if the case comes to hand later than twenty-four hours, enlargement of the original wound and drainage is the best plan, on the possibility that the infection is becoming localized; earlier, it is wisest to open the abdomen through a separate incision. The methods best adapted to this class of wounds are simple suture and simple suture with colotomy, resection not being deemed advisable. Drainage of the retrocolic space is always recommended.

A synopsis of 12 illustrative cases is given; 7 died and 5 recovered.

In wounds of the spleen the presence of free fluid in the abdomen, evidences of hæmorrhage, and the exit and entrance wounds diagnose the condition.

Splenectomy is usually indicated.

Two cases are reported with one death and one recovery.

Wounds of the liver, gall-bladder and ducts are usually complicated by damage to the overlying lung or pleura. It is not usual to have much destruction or disruption of tissue in wounds of the liver and post-traumatic jaundice is uncommon.

The clinical symptoms may be remarkably absent, the lung symptoms frequently disguising the abdominal condition. Abdominal rigidity, increase of pulse, and temperature and pain over the liver were observed.

Cases showing progressive hæmorrhage or complications of other viscera only were operated.

A synopsis is given of 14 cases all of which recovered.

In kidney wounds, extensive organic disintegration may occur with merely slight wounds. Hæmaturia may or may not occur; in severe injury the kidney pelvis is usually blocked by a blood-clot.

Treatment consists in: (1) simple drainage, (2) kidney suture, and (3) nephrectomy.

Three cases are reported, all of which recovered, simple drainage being used in two and nephrectomy in one.

In wounds of the bladder, it was observed that intraperitoneal wounds are usually complicated by injuries to the rectum and small bowel, and that a non-penetrating wound of the abdominal wall may cause rupture of a full bladder. Clinically, the symptoms were the usual ones of bladder injury. Drainage, suprapubic, urethral, or perineal, was indicated. Four cases are reported with one recovery and three deaths.

In wounds of the rectum the entrance wound is usually in the buttocks and, as a rule, fracture of the pelvis and injuries to the small bowel complicate the case. Hæmorrhage is profuse, and appears from the rectum as well as internally. The treatment is that of the complications. Two cases are reported with two deaths.

The conclusions are as follows:

1. In the majority of penetrating abdominal wounds operation offers the best chance of success. Spontaneous recovery rarely occurs.

2. It is advisable to wait one or two hours for symptoms of shock to abate unless evidences of progressive hæmorrhage are found. Warmth and 1 ccm. of pituitary extract are used.

3. Three to four pints of saline administered subcutaneously during operation and closed ether anæsthesia are to be recommended.

4. Careful abdominal inspection and examination before instituting treatment is advisable.

5. In early cases of extensive peritoneal soiling the abdominal cavity is to be washed out. After peritonitis has set in, drainage only should be used.

6. Speed and every possible avoidance of shock are important factors.

7. Post-operative rectal saline and subcutaneous infusions are to be recommended.

8. The prognosis depends on the degree of injury and the time elapsing before treatment is instituted. Early operation offers the best and surest chance of ultimate success. P. M. CHASE.

Abadie, J.: The Treatment of Penetrating Wounds of the Abdomen (A propos du traitement des plaies penetrantes de l'abdomen). *Bull. et mém. Soc. de chir.*, Par., 1916, xlii, 489.

The author reports on two series of observations: those treated by laparotomy, and those which recovered in spite of non-interference and in which the proof of penetration had been made either by X-ray or by visible lesions.

Laparotomy was performed on 15 cases in 9 months, including cases tangential to the peritoneum, univisceral, intestinal perforation, laceration of the liver, laceration and perforation of the intestines, perforation of the rectum, bladder, and small intestine; all these cases recovered. The cases upon which a laparotomy was performed and the individual succumbed included multiple sectioning of the small intestine, rupture of the urethra, perforation of the colon, crushing of the cæcum, perforation of the iliac fossa, and double perforation of the bladder.

It is generally admitted that wounds made by bullets are less grave than those inflicted by fragments of Howitzer shells. However, the proportion of cases wounded by one or the other means, depends upon where and how the fighting is carried on. The method of fighting in trenches, closely situated, explains the rarity of bullet wounds, and those occurring are extremely severe, due to the short distance. The author has never seen a case of a wound of the buttock with abdominal penetration recover without actual interference; the peritonitis reveals the seriousness of a small orifice of an anodic appearance. The presence of perforations or lacerations of the vesicle aggravates the prognosis considerably. One of the author's cases on whom he operated, recovered; three died.

Whether or not to operate at once in shock or to postpone the operation is a question of considerable importance. Frequently the wounded have to be carried for a distance of 12 kilometers, and as the shock reveals two essential causes, severe hæmorrhage or nervous shock, the selection of treatment is momentous. A hæmorrhage that has allowed a patient to be carried 12 kilometers could be modified momentarily in its effects by injections with serum and adrenalin; the nervous shock can assuredly be lessened by tonics. The method pursued by the author consists in: immediate injection with camphorated oil, ether, morphine, if the wounded suffers intensely, abundant injections with serum and 1 mg. of adrenalin; if intravenous injection is indicated, it should be given liberally. The injection with serum is continued even during the operation if it is indicated by the patient's pulse. In the majority of cases the author has poured 100 to 150 ccm. of ether into the abdominal cavity, notably the pelvic; the ansæ are cleaned by means of compresses im-

bibed with warm serum; in two cases he has replaced the ether by salt solution. Pelvic drainage has been practiced in all cases but one, sometimes a second drain is inserted toward the lesions. For lateral and terminal anastomoses, the author praises the efficiency of the coupled forceps of Temoin.

Post-operative care consists in absolute diet, Fowler's solution, by the drop method, rectally. A maximum absorption of 4 to 5 liters a day is considered sufficient.

The author recommends the establishment of surgical stations near the front; systematic arrangement in the immobilization of surgical ambulances for a small space especially for laparotomies; during fighting, specialization of a unit for that purpose, where the number of units is sufficient, if not, sending a reinforcing unit with assistants and all the material necessary for efficient treatment.

The author believes that the treatment of choice for penetrating abdominal wounds, in war as well as peace, is laparotomy. RAOUL L. VIORAN.

Lancer, T. F.: The Acute Surgical Abdomen. *Med. Rec.*, 1916, lxxxix, 648.

The author's paper is based on a recent series of unselected acute abdominal cases operated on by him at the St. Laurence Hospital, New York, most of them desperately ill, such as one finds coming into an emergency service by ambulance. He makes a special plea for the early recognition and prompt operative procedure in this class of cases.

The following is a classification of this series of 30 acute abdominal lesions:

In Group A, in 19 cases, or 63.3 per cent of the total, the appendix was the offender. Of these cases, 8 had had one or more previous attacks. In 6 cases the inflammatory process had not extended beyond the walls of the appendix; that is, they were operated upon early. In 10 cases of appendicitis, the damage had extended beyond its origin, causing a local peritonitis with limiting adhesions. In 3 cases diffuse peritonitis had resulted from delay in submitting to operative interference. Of these 19 cases of appendicitis, only 6 were seen early; that is, before the infection had extended beyond the appendix.

In Group B, in 5 of the total cases the uterine adnexæ were at fault.

In Group C, in 3 cases the biliary passages were the site of the lesion.

In Group D, there were 3 acute operative cases: a case of abscess between the layers of the mesentery of the small intestine; a subdiaphragmatic abscess of the left side, traumatic in origin; and a case of diffuse peritonitis thirty hours after perforation of a duodenal ulcer.

The leucocyte count proved valuable, especially in cases with little or no elevation of temperature, low pulse-rate, and slight abdominal signs, as in many of these cases the increased total count or preponderance of polymorphonuclear cells in the differential count was the only evidence of the seriousness of the lesion.

Abdominal muscular rigidity, pain and tenderness, and a blood picture that shows a high total white cell count and a high percentage of polymorphonuclear cells in the differential count, or either one, constitute the "essential triad" for demanding operative exploration of the abdomen. The only exception would be in a case where the surgeon was sure that these signs were due to an acute salpingo-oophoritis which should be treated conservatively at the beginning. EDWARD L. CORNELL.

Crispin, E. L.: Visceral Crises in Angioneurotic Œdema. *St. Paul M. J.*, 1916, xviii, 127.

A large number of patients suffering from visceral crises, particularly of the erythemic, purpuric, angioneurotic group, are advised to undergo surgical operations.

The author calls attention to this group of cases and discusses the diagnostic importance of visceral crises more from the standpoint of value in negativing or avoiding surgery which does not give relief than from the standpoint of too closely differentiating interrelated medical conditions.

Severe abdominal pains which do not conform to the true surgical types may be confused with visceral crises for which surgery would be of no benefit.

When a history of severe abdominal pain is given which does not conform to true surgical types, careful inquiry should be made as to the presence at any time of urticarias, erythemas, purpuras, and swellings of angioneurotic œdematic types.

A history of recurrent severe abdominal pains, with constancy in the nature and duration of the attacks, with skin manifestations of any of the exudative erythemic forms, with or without noticeable association with the abdominal pains, should excite suspicion as to the presence of crises of angioneurotic type.

A diagnosis of visceral crises of angioneurotic type should not be made until careful examination has excluded or made independent surgical causes. In this roentgenologic examination of the gastro-intestinal tract is valuable negative evidence. Syphilis and tuberculosis should be excluded.

The constancy in the recurring attacks of pain not conforming to surgical types in patients who have had skin manifestations of the exudative erythema group and whose general condition does not account for the suffering they have had to bear will warrant a diagnosis of visceral angioneurotic œdema.

Repeated or even single attacks of intestinal colic, with tumefaction, in which the patient's general condition is too good for the extent and severity of the trouble and in which history of swellings can be obtained, may be of this type. To wait is good surgery. The rapid return to health is strongly suggestive of visceral angioneurosis.

Having determined the medical nature of these

angioneurotic visceral crises or even in these cases of angioneurotic œdema or the entire exudative erythema group, we should endeavor to work out the sources of toxæmia. These may be: foci of pus in the upper respiratory tract and sinuses, bacterial absorption, idiosyncrasies to heat, cold, chemicals, parasites, carbohydrates, or proteins that are the causes for anaphylaxis.

Removing the causes for anaphylaxis, whether it be idiosyncrasy, in one patient for ice cream — some constituent or the cold — banana in another, alcohol in a third, or any anaphylactic base or source of exogenous or endogenous irritation or poison, may give the patient relief that the advised surgery would not have given him.

EDWARD L. CORNELL.

Makins, G. H.: A Study of the Symptoms and Complications of Gunshot Wounds of the Solid Abdominal Viscera. *Brit. J. Surg.*, 1916, iii, 645.

The author reports his observations on a series of gunshot wounds of the solid abdominal viscera; these observations were made in a base hospital and do not include the immediate results of the wounds.

In wounds of the liver, especially those made by bullets, in many cases no evidence of liver injury is detected except that afforded by the course of the missile, provided the bile-duct or no large vessels are injured. Thirty-seven cases only are reported on the grounds that the liver wound was the chief element and as illustrating the varying degree of gravity which lesions of this organ may assume.

Two classes of wounds were observed: (1) those of a rupture due to contusion and (2) simple perforations. The liver, offering considerable resistance as it does, is frequently comminuted or ruptured.

The most common course of the missile is transverse. Of the 37 cases, 21 were transverse. Also the simple furrows often give rise to more troublesome and persistent hæmorrhage than the perforating wounds.

Shell wounds are usually most extensive; they frequently give rise to secondary hæmorrhage, and almost invariably are seriously infected from the start. Under these circumstances, it is the rule to have progressive necrosis and sloughing of a great part of the liver.

The most common coexistent injury is pleural and lung involvement. In the 37 cases, 25 showed pleural injury. Next in frequency come injuries of the stomach. Wounds of the right kidney are not rare but have a very good prognosis.

The symptoms and signs may be entirely wanting or very slight. Of the 37 cases, 7 showed no physical signs of liver injury. However, bleeding into the peritoneal cavity is one of the most common results and may lead to a rapidly fatal issue; at best, it is one of the most troublesome complications and is not often seen at the base hospital. If injury is on the inferior surface the blood will collect in the lesser sac, and if on the anterior surface it will eventually collect in the pelvis.

Secondary bleeding usually occurs about the tenth day and is always associated with septic infection; in the series it occurred 4 times. It is accompanied by pain, abdominal distention, rise of temperature, and acceleration and loss of pulse volume.

In 12 of the 37 cases jaundice was observed, being deepest in serious septic infection. Deep staining of the urine is rare. It is believed to be hæmolytic in origin.

The most characteristic sign is the escape of the bile from the wound. Some form of biliary fistula was present in 15 cases of the series. Persistence depends mainly on the size and degree of infection of the wound. Of the 15, 7 showed fistula opening by way of the pleura, and all recovered. In none was the collection of the bile in the peritoneal cavity noted and in none was the gall-bladder perforated.

With an open infected shell wound temporary suppuration is the rule but is of no great importance. The formation of secondary abscesses, however, is a grave matter. In the 37 cases, 4 subphrenic abscesses developed with 2 deaths and 2 recoveries.

The post-mortem records show that of 25 deaths 60 per cent were due to sepsis and 40 per cent to secondary hæmorrhage. The most prominent complication causing death was hæmothorax; 7 cases died from infection from the effusion. There were 3 cases in which kidney wounds complicated the liver injury. Practically all the deaths may be said to be due to sepsis, as secondary hæmorrhage is always due to infection.

The treatment at the base hospital is purely expectant. If the missile is easily accessible, it may be removed, otherwise no fresh incision is made.

In wounds of the spleen, diagnosis is rarely made on any grounds beyond the position of the external wounds and the direction of the internal track. Left hæmothorax is the most prominent complication, followed by renal injury.

Spontaneous healing is to be expected with simple perforations and moderate lacerations of the spleen. Death from hæmorrhage from this organ is not at all common.

Injuries to the pancreas are just as difficult to diagnose as those of the spleen and are usually found at operation or autopsy. Three cases of wounds of the pancreas are cited.

In injuries to the kidneys the simple perforations may often be regarded as negligible. Twenty-seven cases are included under this head as showing the complications most frequently associated with injuries to the kidneys. In 21 of these cases the wound of entry or exit was in the loin.

The most common complications outside of injuries of the hollow viscera are wounds of the liver, spleen, and pleura.

Among the signs and symptoms, hæmaturia is the most prominent, although often absent. It is rarely severe or persistent. In the series, only 11

showed primary hæmaturia. Likewise, the degree of hæmaturia in no way accords with the severity of the damage to the kidney.

Two interesting cases of kidney wounds are described.

Secondary bleeding occurred in 12 cases, usually about the fourteenth day. In every case the urine was infected. Hæmorrhage occurs either as a persistent hæmaturia or as a perirenal hæmatoma. This latter as a rule travels into the iliac fossa and along Poupart's ligament, and is accompanied by the development of gravitation ecchymoses of the overlying skin. There is also a slight rise of temperature.

Intraperitoneal hæmorrhage is usually immediately fatal.

Extravasation of urine is not common. It is believed that the recently wounded kidney does not secrete actively, as the escape of urine externally during the first 24 or 36 hours is not abundant. Escape of urine externally was noted in 7 cases of the series. This condition is more marked where the kidney pelvis is injured.

The most common direct cause of death is secondary hæmorrhage. In 17 fatal cases, 7 were due to this condition.

Of fatal complications, the liver was wounded in 6 cases, the spleen in 2, the spine in 1, and hæmothorax developed in 3.

In the treatment, rest is paramount. Operation is rarely required for primary hæmorrhage. However, if the kidney is hopelessly damaged it should be removed.

For secondary hæmorrhage, nephrectomy is indicated and is often difficult owing to the comminution of the organ and the extravasation of blood.

A large blood-clot in the bladder should be removed by a lithotrity evacuator or by suprapubic cystotomy. In primary hæmorrhage, suture, packing, or partial removal may be tried. Of 8 nephrectomies, 6 recovered. P. M. CHASE.

Wells, B. H.: The Care of Abdominal Surgical Cases. *Am. J. Surg.*, 1916, xxx, 105.

The patients are first seen, examined, and treated at the dispensary of the New York Polyclinic, so that a knowledge of their general physical, as well as their pelvic and abdominal, conditions is obtained. If operation is considered necessary, they are admitted to the hospital and prepared, the preparation usually being very simple and consisting of a mild laxative on the morning of the day preceding operation, followed by an enema in the evening, together with the preparation of the skin.

Severe purging is avoided as being unnecessary and weakening, as well as a source of great discomfort to the patient. (The author strongly emphasizes this point, as there are still many who employ drastic measures to clean out the intestinal tract.)

Usually the evening before operation the abdomen is shaved and scrubbed with a tincture of green soap and warm water applied with a piece of clean gauze. The soapy water is carefully and completely washed off and the skin dried with alcohol and covered with a light dressing of sterile gauze. When the gauze is removed before operation, the dry skin is painted with a 3.5 per cent tincture of iodine. In emergency cases the preliminary preparation may be omitted and the operation safely performed a few minutes after the iodine painting.

A moderate Trendelenburg position is used in nearly all cases except in acute appendicitis and where there is reason to fear some valvular lesion of the heart or degeneration of the cardiac muscles.

Gentleness of manipulation is strongly urged; no rough handling or sponging of the peritoneal surfaces is allowed. The vessels are ligated before being divided and clamps are never applied except to tissues that are to be removed. This is an important means of avoiding thrombosis and consequent embolism. Great care is taken to repair all torn or denuded peritoneal surfaces.

Before the patient is taken off the table, she is given a hypodermatic injection of atrophine sulphate, gr. 1/120, followed in a few minutes by one of eserine salicylate, gr. 150. The eserine can be repeated at six-hour intervals as needed. It is found to have a positive effect in relieving postoperative pain and in helping to blot out the recollection of pain. It lessens nausea and shock and promotes intestinal peristalsis. Morphia is needed to control pain in only one case in four and then rarely more than one dose of a sixth or a quarter of a grain.

After a long anæsthesia, the stomach is washed out at the end of the operation. If there is vomiting, water with a little bicarbonate of soda is given freely by mouth and, when the condition will permit, the head and shoulders are raised. To relieve shock, to supply fluids, to promote peristalsis, and to control thirst, a half pint to a pint of pure water is given per rectum every four hours until the bowels move or until the patient can take fluids by mouth.

After operation the patient is allowed from the first to turn in bed or be moved by the nurse. On the fourth day, unless there is some contra-indication, she is lifted out of bed into a chair for a short time, say a half hour. The time out of bed is gradually lengthened, as the patient's strength increases, to an hour or more twice a day and the patient is encouraged to take a few steps so that by the end of the week she is able to walk freely.

In the last 500 abdominal cases recorded, there were 11 deaths: 3 from embolism, 3 from sepsis, one each from pneumonia, general peritonitis, exhaustion, ileus, and intestinal obstruction.

The complications were as follows:

Deep wound infection	6
Skin infection	13
Hæmatoma	10
Fæcal fistula with spontaneous healing	2
Hernia	1

EDWARD L. CORNELL.

McCrae, T., and Coplin, W. M. L.: Galatinoid Carcinoma (Morbus Gelatinosus) of the Peritoneum. *Am. J. M. Sc.*, 1916, cli, 475.

An account is given of a case of gelatinoid carcinoma of the peritoneum in a male negro, aged 41, who had been troubled with chronic ascitis for four years, and had had 57 successful tappings. For three years the fluid showed no particular features, then gelatinous colloid material appeared and was present for a year until death occurred. During the greater part of this period the patient's condition was excellent. The liver and spleen showed enlargement at one time and later became reduced in size. Shortly before death many hard, round, movable masses were found in the abdomen. There was intractable diarrhœa for the last few weeks of life.

At autopsy it was found impossible to find the primary seat of the disease because of the matting together of all the viscera. The diaphragm had been perforated by the growth and metastatic nodules were found in the lungs. The universality of the retrograde changes in the epithelium, not commonly encountered in cancer, the authors think was due to some condition which their study failed to disclose. Apparently the proliferating epithelium encountered some antagonistic influence which was constantly breaking it down. Complete early removal of the disease may be curative. Even incomplete removal of the mass may be followed by long intervals before recurrence takes place.

H. G. Sloan.

Handley, W. S.: A Method of Treating General Peritonitis with Obstruction; Its Application in Military Surgery. *Brit. M. J.*, 1916, i, 519.

The author discusses those cases of general peritonitis in which the accepted modes of treatment have failed to avert or relieve paralytic obstruction of the bowels and cites a case successfully treated along lines laid down in his article.

In cases of general peritonitis where the picture is one of complete obstruction death is only a matter of hours. Immediately preceding this stage, however, is one not described in textbooks, wherein, while obstruction is usually complete, the pulse is relatively good, the vomit is not offensive, and the abdomen rigid below the umbilicus but moderately soft above with slight respiratory movements. This is the last stage in which surgical interference may help.

Fortunately, general peritonitis is rarely universal. The infection no matter where its source, as a rule begins in the pelvis and gradually spreads upward, gravity having carried the septic material downward. Thus there is quite a period in the disease in which the upper abdomen, i.e., above the umbilicus, is comparatively free from infection.

Likewise the presence of persistent active vomiting may be considered hopeful, in that it shows that the stomach and upper intestine still retain their contractile power, although reversed. Hence, Handley believes that surgical interference in the upper abdomen before general collapse, is advisable and should be considered. The interference should involve only the stomach, jejunum, and transverse colon.

Jejunostomy fails it is believed because it cuts off the supply of fluid to the mucosa of the large intestine. Handley, however, recommends a jejunocolostomy to the transverse colon with cæcostomy and pelvic drainage. This relieves the vomiting, establishes an emergency intestinal canal which supplies the body with clean food and fluid, conditions necessary to overcoming the general infection.

This procedure the author states may be carried out quickly and easily and practically without shock.

A case is cited in which after an operation for pelvic appendicitis with beginning peritonitis the symptoms of intestinal obstruction supervened giving a characteristic picture of ascending peritonitis with intestinal obstruction. A jejunocolostomy with a cæcostomy was then done with immediate improvement and complete recovery.

In closing Handley states, "I hold no brief for my conclusions and only ask that they shall be tested."

P. M. Chase.

Saliba, J.: The Antiseptic Action of Ether in Peritoneal Infections. *J. Am. M. Ass.*, 1916, lxvi, 1295.

Saliba states that he has introduced ether into the abdominal cavity as a routine measure in 248 hospital cases of peritoneal infection. The injection is made with a syringe just before the last peritoneal suture is tied.

He concludes as follows:

1. Ether experimentally and clinically has been proved to have a bactericidal action.

2. In peritoneal infections it is a safe and beneficial antiseptic.

3. The dose of ether instillation into the peritoneal cavity is one ounce for a child above four years and three ounces for an adult.

4. Generally no untoward after-effects and complications follow its use.

5. Any possible toxic action of ether on the various body organs is very slight.

A. Ehrenfried.

Finochietto, R.: Retro-Inguinal Hernias. *Surg., Gynec. & Obst.*, 1916, xvii, 554.

Retro-inguinal hernias (Corbellini, 1906) are the right hernias of the classics, the internal hernias of Tillaux, the "juxtafuniculaires" of Villete.

They are called retro-inguinals, because coming outside, they push before them the posterior wall of the inguinal canal, the transversalis fascia. They are found in 10.63 per cent of hernias, coming to operation. The principal alteration of the walls is an atrophy of the conjoined tendon and Hessert's triangle.

The hernial tumor is slightly attached to the cord, but its base is fixed, owing to its continuity with the

transversalis fascia, which in this place presents its fibers of re-enforcement, strong, but separated.

According to the predominant element in the hernial tumor, i.e., the peritoneal sac, the preperitoneal fat, or viscera, the hernias are classified in the order of their frequency: sacular 73 per cent, lipomatous 20 per cent, splanchnic 6 per cent. In the lipomatous variety, occupying the under part of the base of the hernia, there is found an ample cavity, with walls formed by connective tissue, which is a prolongation of Bogros' space. These three varieties of retro-inguinal hernias are independent of each other; they do not follow one another.

Simmons, C. C.: The End-Results in Seventy Consecutive Cases of Umbilical Hernia Operated upon at the Massachusetts General Hospital. *Boston M. & S. J.*, 1916, clxxiv, 342.

The length of time the cases were followed after operation was from one to four years. Cases without recurrence at the end of one year were considered cured, since the records showed that all previous recurrences took place within one year from operation.

The operations reported were performed by 21 different surgeons. The three main types were: (1) closure of the ring vertically with or without an overlapping of the aponeurosis; (2) transverse closure of the ring without overlapping; (3) transverse closure with overlapping of the aponeurosis — the Mayo operation. The author described his technique in the last method which he has used in 14 cases without recurrence.

Simmons divides the cases into three groups: (1) children and small herniæ in thin adults, 15 cases, 10 traced, all cured by various types of operation; (2) stout adults, 45 cases, one death directly attributable to the operation for hernia, a mortality of 2.4 per cent. Six cases of strangulated hernia were included in this group. Of these 45 cases, the hernia recurred in 10, or 22.2 per cent. In 30 cases closed by the Mayo method 10 per cent recurred. In 14 cases closed vertically with or without overlapping, 42.8 per cent recurred. Local sepsis apparently played little part in the recurrent cases of 31 clean cases, 6 recurred; of 14 in which there was local sepsis, 3 recurred. Of the recurrent cases 4 were sutured with chromic gut, 2 with kangaroo tendon, and 3 with non-absorbable material.

The recurrent cases are described in detail and the cases in each group carefully analyzed, the following conclusions being reached:

1. Small umbilical herniæ in thin adults, and umbilical herniæ in children, may be cured by any operation which removes the sac and closes the defect in the abdominal wall.

2. Cases of umbilical hernia in stout adults are difficult to cure. The Mayo operation of transverse closure of the ring with an overlap of the aponeurosis gives the best results.

3. In adults closure of the ring by any other method than the Mayo, in a general hospital, is followed by 46.4 per cent of recurrences. Recurrence, if it is to take place, usually does so in less than one year.

4. The suture material employed has no relation to the libility to recurrence.

5. Skin sepsis is very likely to occur, but apparently has no relation to recurrence.

E. FISCHEL.

GASTRO-INTESTINAL TRACT

Gasbarrini, A.: The Ionic Concentration of the Gastric Contents in Some Stomach Diseases (Sulla concentrazione ionica del contenuto gastrico in alcune malattie dello stomaco). *Internat. Beitr. z. path. u. ther. d. ernahrungss.*, 1915, v, 391.

The author used Sorensen's lately introduced calorimetric method of estimating the ionic concentration of the gastric contents. This ionic concentration gives an index of the disassociation of hydrochloric acid; i.e., of the amount of free hydrochloric acid in the stomach.

The author submitted to this process the gastric liquids from 36 patients with various stomach diseases and from his results he is of the opinion that the calorimetric method is excellent for clinical diagnostic examinations.

The method and technique are fully described, also a detailed tabular statement is given of the 36 cases examined — gastric ulcer, dyspepsia, etc.— and the findings in each case. W. A. BRENNAN.

Friedman, J. C.: Time Relations of Gastric Pains, with Special Reference to Gastric Adhesions. *Am. J. M. Sc.*, 1916, cli, 735.

Friedman reports a number of operated cases of gastric pain with special reference to the time of occurrence as a diagnostic help. He divides all gastric discomfort of the intragastric and perigastric regions into continuous and intermittent varieties. The continuous pains are most frequently due to carcinosis, to marked pyloric obstruction, and to penetrating ulcers, with peritoneal involvement. The intermittent pains are divided into immediate, early, and late. The immediate are found frequently in ptosis, neurosis, obstruction of the cardia, and various other conditions.

The early pains, including those occurring fifteen to sixty minutes after eating, are most often due to adhesions in any part of the stomach, including ventral hernias and pericholecystitis.

Late pains include those occurring one to three hours after eating, and indicate an increase in intragastric pressure or pylorospasm, of which the most frequent cause is hyperacidity. J. W. TURNER.

Barbacci, O.: Gastric Volvulus in Hour-Glass Stomach of Congenital Malformation; 360° of Rotation (Volvulo gastrico in stomaco a clessidra per malformazione congenita—360° di rotazione). *Riforma med.*, 1916, xxxii, 141.

Volvulus of the stomach is undoubtedly a rare affection and there are only 39 observations of it

on record. In recent years it has been seen more frequently than in the past owing to the greater number of surgical interventions. The affection occurring in a so-called hour-glass stomach where the rotation is in only one gastric segment is still rarer. There are only 10 observations of this kind. It is exceptional for the rotation to exceed 180°. Only 3 cases have previously been recorded in which the rotation reached the limit of 360°. The author now adds a fourth to these 3 cases. The clinical history of the case is wanting. The patient reached the hospital in a moribund condition and died shortly after his entrance. The particulars were gleaned from the autopsy. On opening the abdomen there was found in the left precordial region a sac the size of a child's head, of semi-ovoid shape, the base being above and the apex below. It reached to the level of the iliac crest, at which point it was twisted upon its axis and evolved into another apparently smaller sac of semilunar shape, which occupied all the right hypogastric region and had a general direction from left to right. On the left of this sac were two greatly distended loops of intestine, the upper corresponding to the descending colon and the lower to the sigmoid colon which was buried in the lower pelvis. On the right side of the sac was another distended loop which corresponded to the ascending colon. The visceræ generally were malformed and displaced.

The lower of the two sacs referred to has undergone a torsion on its axis. This torsion amounts to 360°, so that the anterior face of the sac which is presented to view is really the visceral anterior face after a complete twist. This torsion is verified by complete removal of the sac and its attachments.

From the detailed findings the anatomic diagnosis was: gastric volvulus in bilocular stomach with 360° of rotation; abnormal mobility of the pylorus and duodenum; congenital malformation of the gastrohepatic ligament; slight pulmonary emphysema with hypostasis and œdema; degeneration of the myocardia and liver; hepatic calculus; incipient aortic, splenic, and renal arteriosclerosis, etc. Histologic examination showed no alteration whatever in the stomach walls in either sac.

The author thinks the two conditions in this case which merit special attention are the bilocular conformation of the stomach and the gastric volvulus. Bilocular stomach is not rare. It may be congenital or acquired, although many authorities deny the existence of a congenital variety.

The author is convinced that in his case the deformity was congenital and gives his reasons, discussing the theories of other writers, Barnabo, Veyrassat, Buedinger, Wallstein, etc., who have devoted considerable attention to the occurrence of this congenital anomaly. Veyrasset has laid down the dictum that in order to be considered congenital the following should be fulfilled:

1. The biloculation should not cause any gastric disturbance during life.

2. It should not disappear under the influence of insufflation of the stomach.

3. It should not be accompanied by any appreciable lesion of the gastric tunica.

Biloculation is as likely to be met with in the fœtus and in the infant as in the adult and the old.

In the author's case the second and third conditions were fully met. The first conditions could not be established owing to the lack of a sufficient history of the case.

The author next takes up in detail the consideration of volvulus occurring in connection with bilocular stomach. From a review of the literature of the subject he reduces such cases to 10 only. He gives a short résumé of these 10 cases. Only in the 3 cases reported by Hedlung, Schuele and Walther, and Kocker did the rotation reach the limit of 360° as in the author's case; and that of Schuele and Walther was the only one in which the other concomitants agreed with those of the case now reported. The author's case is therefore unique.

W. A. BRENNAN.

Burge, W. E., and Burge, E. L.: The Cause of Gastric Ulcer. *J. Am. M. Ass.*, 1916, lxvi, 998.

In accordance with the theory that gastric ulcer is caused by decreased resistance in the limited areas of the gastric wall, the authors undertook this investigation to determine experimentally if possible whether or not such diminished resistance would give rise to gastric ulcer. They point out what has been known for some time: that the resistance to the action of the digestive juices of limited portions of the mucosa of the stomach is decreased by cutting off the blood supply to these portions as, for example, by a clot in a small blood-vessel (thrombosis) or by the ligation of the vessel, and that under such conditions the area is digested by the pepsin with the formation of an ulcer. The fact that gastric ulcer occurs so frequently in anæmic persons led to the advancement of the theory that the oxidative processes are decreased and that this may be the cause of the diminished resistance of the tissues.

Working upon the theory which assumes that normally a balance exists between the oxidative processes of the cells of the mucosa and the digestive action of the pepsin in the stomach, and that if this balance is destroyed, as for example by depriving a limited area of oxygen by cutting off the blood supply and thereby decreasing the oxidative processes of the area, this area should be digested by the pepsin with the production of ulcer, the authors devised numerous experiments to imitate the protective mechanism as thus set forth. From their experiments they are able to draw the following conclusions:

1. The decreased resistance of a circumscribed area of the stomach to the digestive action of gastric juice is due to a decrease in the oxidative processes of the cells of the area. Gastric ulcer is due to the subsequent digestion of the area by pepsin.

2. The resistance of unicellular organisms (para-

meciums) to the digestive action of the proteolytic enzymes can be increased or decreased by increasing or decreasing the intensity of the oxidative processes of the organisms; the greater the intensity of the oxidative processes the greater the resistance, and vice versa. GEORGE E. BEILBY.

Elliott, T. R., and Henry, H.: Traumatic Gastric Ulcers. *Brit. M. J.*, 1916, i, 523.

The formation of gastric ulcers following trauma to the stomach is discussed.

Surgical work with the army in France has proved conclusively the value of early operation in gunshot wounds of the abdomen. It is the consensus of opinion that any wound of the intestinal tract is less likely to be fatal if repaired immediately than when left to rest and nature, although Surgeon General Sir George Makins claims that it is unwise to open the abdomen in cases where only the stomach is supposed to have been wounded.

While the chief danger in intestinal wounds is from peritonitis, in stomach wounds it is less to be dreaded, as frequently adhesions seal the aperture and the gastric contents that do leak out are not very septic. However, the real danger in this latter class is from secondary hæmorrhage due to erosion of the injured tissues by the gastric juice.

Immediate hæmatemesis and melæna are rare as the bleeding is usually intra- or retroperitoneal. However, these symptoms often appear during the second week and then are to be interpreted as due to an extending ulcer of the stomach or duodenum. These ulcers are the exact counterpart of the non-traumatic ones with the exception that gastric fissure is much more liable to formation in the track of the initial injury.

A detailed clinical report is given of the 4 illustrative cases, 3 of which died, 2 from uncontrollable hæmorrhage and one from widespread septic infection. In all 4 cases the missile either penetrated the stomach or came so close as to cause a direct injury to the wall. None of the cases was operated upon and hæmatemesis and melæna occurred in each during the second week.

In the case which recovered, the stomach was probably contused and recovery from following ulcer unexpected, as the rule in these cases is subsequent death. P. M. CHASE.

Verbrycke, J. R., Jr.: Post-operative Treatment of Peptic Ulcer and Cholecystitis. *Med. Rec.*, 1916, lxxxix, 774.

The first step in the post-operative treatment begins at operation. Whenever possible, the ulcer should be excised, kept from contamination, and examined for organisms from which autogenous vaccines can be prepared and administered during convalescence.

There can be no routine treatment for ulcer after operation. The individual patient must be treated, bearing in mind the possible cause of the trouble, the character and position of the ulcer found at operation, and the nature of the operation itself.

In cases of excision it is necessary simply (1) to regulate the diet for from ten to fourteen days; (2) to administer atropine or belladonna to prevent spastic contraction of the pylorus which would tend to produce further trouble; (3) to make and administer autogenous vaccine; (4) to avoid irritating purgatives; (5) before the patient is discharged to make search for the original focus if it has not already been located and take steps to eliminate it; and (6) to instruct patients to report at least every two months for a year with a specimen of stool, while on meat-free diet for three days, to be examined for occult blood.

Not only does the location of the ulcer influence the after-treatment, but also the conditions found at operation. A large callous ulcer of many years' duration, if ever curable by rest, will certainly take longer than a small non-indurated one. Perforated ulcers, naturally, demand certain other treatment which comes purely under the domain of the surgeon, such as (in acute cases) the Murphy salt solution and the Fowler position. For some reason perforated ulcers seem to tend to heal without much difficulty after the perforation is closed.

Ordinarily results in gall-bladder cases may be said to be decidedly better than those following operations for ulcer; however, the number of secondary operations required and the not inconsiderable number having a continuance or recurrence or trouble after drainage or even removal of the gall-bladder would indicate that there is room for improvement in the treatment. The author believes that the reason for many of the poor results lies in the fact that the original factors which caused the trouble have not been influenced.

The patient should have an individual diet list based upon the condition of digestion and the weight, but in all cases fat should be restricted to a greater degree than the other food products. In the obese fat reduction should be practically absolute for a time so that the patient may use up some of his own. Some control should be kept over the fat ingested for at least a year. If the bowels tend to become sluggish from the absence of fats, mineral oil, which lubricates without being digested, may be given.

Next to fats the carbohydrates should be restricted. Judgment is required in determining how far this may be safely carried. Proteins are allowed in sufficient quantity to maintain nitrogenous equilibrium. All of the vegetables that are desired may be taken, also fruit, provided the chemical condition of the stomach does not contra-indicate its use.

The bowels should be kept open. Plenty of water will help, with the addition of Carlsbad sprudel salts when required.

After convalescence exercise should be prescribed. Outdoor exercises, such as walking and golf, are especially desirable, also special abdominal exercises which tend to reduce the fat, stimulate the circula-

tion, and correct sluggishness of the biliary as well as the whole digestive tract.

Post-operatively 15 grains of hexamethylenamine a day should be given for a number of months unless contra-indicated by some untoward action. One five-grain tablet of sodium gylcocholate or its equivalent two or three times a day should be administered for some months.

Thyroid extract, for its action on fat metabolism, should be used temporarily in the cases in which it would seem that there was deficiency of thyroid secretions with poor oxidation. Small doses should be used at first and close attention paid to the blood-pressure and pulse. EDWARD L. CORNELL.

Mackay, W. A., and Macdonald, I.: Perforating Pyloric and Duodenal Ulcers. *Edinb. M. J.*, 1916, xvi, 280.

The article briefly reports three cases of perforating pyloric and duodenal ulcers with operation. One died and two recovered. These three cases were from a series of 250 operations for gastric and duodenal ulcers occurring in the authors' experience in southern Spain.

All the cases gave the typical history of duodenal ulcer of several years' standing.

In the first case, perforation occurred in the middle of a large œdematous mass occupying the pylorus, which prevented the sutures from holding. Under these circumstances, the abdomen was thoroughly dry-swabbed and the pyloric portion of the stomach belayed to the abdominal wall. Two drains through the incision and one through the loin to the kidney pouch were used, being removed on the ninth day. Uneventful recovery followed and two months later gastro-enterostomy was done.

In the second, perforation occurred in an ulcer densely adherent to the posterior border of the liver making suture impossible. The leak was stopped by an omental tag, the abdomen dry-swabbed, a large drain put under the liver, another through the lower end of the incision and a third over the pubis into the pelvis. This patient suddenly died on the fourth day after developing a duodenal fistula.

In the last case, a small perforation occurred in an old ulcer scar on the front part of the duodenum. This was closed by a single catgut suture followed by continuous suture of the serous coats, and a tag of gastrohepatic omentum sutured over all. Following this a posterior gastro-enterostomy was done. One drain was then placed under the liver and a second above the pubis into the pelvis. These were removed on the third day and uneventful recovery followed..

The authors strongly recommend pelvic drainage and immediate operation. P. M. CHASE.

Morgan, E. A.: The Post-Operative Management of Pyloric Stenosis. *Am. J. Dis. Child.*, 1916, xi, 245.

The author's study is based on the personal observation of fifty children who were operated on in the Babies Hospital of New York during the last two years. The post-operative results are dependent to no little extent on the pre-operative condition of the patient.

The maintenance of the body temperature is of paramount importance, A sudden loss of body heat has, in some instances, been the undoubted cause of collapse occurring a few hours later.

The greatest danger is in the exposure incident to the operation, and to minimize this it is advisable to encase the infant's legs and arms in non-absorbent cotton. Under the pad on the operating table is placed a hot water bag which fits into the small of the back and serves the double purpose of supplying warmth and keeping the site of the operation well elevated.

The removal from the infant's stomach, by gastric lavage, of food residue and gas accumulation is the next most important pre-operative measure.

In the post-operative management the maintenance of the body temperature is, as before, of the utmost importance. The infant is wrapped in a warm blanket or cotton jacket and the bed is well equipped with hot water bottles.

For the first hour or two, the head of the bed should be lowered. After nourishment has been commenced, the head of the bed may be raised and from this time on the infant is kept in a semi-erect position. This elevation assists in emptying the stomach, especially in gastro-enterostomy cases, and, at the same time, permits the escape of gas through the mouth.

The use of excessive hypodermic stimulation after operation is to be deprecated; only one measure, namely, hypodermoclysis of normal saline or of glucose solution, is always indicated and this may be safely used as a routine practice. Of the other stimulants, epinephrin, subcutaneously, is the most satisfactory because of the rapidity of its action. Caffein and atropine, hypodermatically, are sometimes valuable, and by mouth dilute whiskey or brandy. The value of blood transfusion as a stimulant is very questionable.

A post-operative rise in temperature is to be expected in nearly all cases. No antipyretic measures are needed for this reactionary temperature, except that care should be taken not to use excessive artificial heat. A pyrexia that persists for more than three days, or one that unexpectedly occurs after the first reactionary fever has subsided, should be investigated as it usually indicates some complication.

Feeding is the most important feature of the post-operative care of infants; a slight error in judgment may precipitate a gastro-intestinal upset that is very difficult to control. It is impossible to feed all children by the same set rule, but a general routine is of value and is applicable to the majority of cases. The aim should be, as soon as possible after operation, to start nourishment in a concentrated and readily digestible form. For this purpose there is no food that can take the place of breast milk and

every effort should be made to procure enough to tide the patient over the first week at least.

An hour after operation, providing the recovery from the anæsthetic has been complete, the patient is given 16 ccm. of water, and an hour later 12 ccm. of breast milk mixed with 4 ccm. of water. It may be necessary at first to use a medicine-dropper for the administration. The breast milk is repeated every three hours, eight feedings a day, and is alternated with the water. Both are gradually increased so that twenty-four hours after operation 16 to 24 ccm. of undiluted breast milk is being given every three hours and a similar amount of water between feedings. At the end of forty-eight hours the child is usually taking 20 to 30 ccm. and at the end of seventy-two hours 30 to 45 ccm. at a feeding. The administration of water by mouth during the first three or four days is of the greatest importance. The time required to increase the quantity of milk to meet the caloric requirements of the child has been on an average five days; in small babies three days may be sufficient and in the well-nourished as much as eight to ten days.

It is wise not to defer putting the baby to the breast longer than one week after operation or when the feeding from the bottle has been increased to about 60 ccm. This is usually on the sixth or seventh day. The nursing must be carefully supervised for the next week, the amount taken at each time being measured by weighing the baby before and after. If the quantities obtained are too small, the nursing may be supplemented by a modified milk mixture.

In well-nourished children a sponge bath may be given every day until the abdominal wound is completely healed and the dressing discarded. In poorly nourished or emaciated infants, an oil rub is to be preferred.

Vomiting, although it is to be expected in a certain degree in a large proportion of the patients after operation, is frequent and troublesome in some cases. The more common exciting causes of vomiting are:

1. Distention due to accumulation of gas either in the stomach or in the intestines.

2. Defects in the operation, such as faulty adjustment of the jejunum and stomach, or incomplete severance of the constricting muscle-fibers by the plastic operation.

3. A too rapid increase of the feeding.

4. The occurrence of complications, especially general peritonitis. Of these causes distention due to gas accumulation is by far the most frequent. If it is mainly intestinal, a colon irrigation, repeated as often as necessary, is all that is required for relief. When the accumulation is in the stomach, the head of the bed should be elevated and the child frequently raised to the upright position to allow the free escape of the gas. In patients who do not respond to these measures, it is well to pass a soft rubber catheter into the stomach before each feeding. Lavage may be employed if the vomiting is persistent, but its use in the first two or three days after the operation of gastro-enterostomy entails not a little risk.

Repeated fæcal evacuations are usually not seen during the first twenty-four hours. At the end of this period, therefore, it is well to give a teaspoonful of castor oil to stimulate peristalsis and remove mucus and gas. The first few stools are usually loose and green in color (or meconium-like if there has been any bleeding into the stomach). Normal breast milk stools are not seen, as a rule, until the fourth day after operation. A too rapid increase in food, especially in children who have been vomiting for several weeks prior to operation, is very apt to produce loose, frequent stools. The measures usually employed for the relief of acute intestinal disturbances are applicable to this condition.

The dressing at operation should consist of a narrow fold of sterile gauze which just covers the incision and is held in place by adhesive strapping; there is seldom any indication to disturb it for the next four or five days. A binder should not be used. The advantage in using a small dressing is that the least hæmorrhage can be readily detected and controlled. The stitches may be removed on the sixth to the eleventh day, depending on the condition of the wound, and after that a protective pad of gauze is all that is required.

Of the 36 infants discharged in good condition, 4 died from a variety of causes, none of which were directly associated with the operation. The deaths occurred two weeks after discharge in two instances and two months after discharge in the others. Two children were lost sight of, and of the remainder 10 were followed for one or two years after discharge, 13 for six months to one year, and 7 for less than six months. EDWARD L. CORNELL.

Bradford, W. H.: Chronic Gastric and Duodenal Ulcer. *J. Maine M. Ass.*, 1916, vi, 232.

The results obtained from surgical treatment of patients suffering from chronic gastric and duodenal ulcer have been among the most satisfactory in all the author's surgical experience. The mortality has been exceedingly low. A man with acute perforation of a chronic gastric ulcer died one week after operation. With this exception, no deaths have followed surgical treatment.

Among his successful cases, the following may be briefly mentioned:

A male, aged 30, was operated on eight years ago for a large palpable mass diagnosed as gastric cancer, and is now perfectly well.

A male, aged 57, had been suffering from gastric ulcer for seven years. In May, 1914, he had the pyloric half of his stomach removed and has gained 55 pounds since operation.

A male, aged about 60, had been taking medicine for stomach trouble for thirty years; he was emaciated and anæmic. He was operated on for duodenal ulcer in November, 1914. After operation his

improvement was wonderful and he had no further need of medicine. EDWARD L. CORNELL.

Mills, R. W.: Observations on Duodenal Ulcer with Special Reference to Its X-Ray Diagnosis. *Interst. M. J.*, 1916, xxiii, 68.

The stomach in uncomplicated duodenal ulcer is generally considered to be characteristically hypertonic. Hypertonic stomachs are characteristic of those of asthenic habitus; consequently either the stomach in duodenal ulcer becomes abnormally tonic, or duodenal ulcer occurs in those who naturally have hypertonic stomachs. Mills thinks an investigation will suggest that both are true. Should certain complicating factors exist, the gastric hypertonus of duodenal ulcer is lost to a degree commensurate with that of the complicating factor. Such factors are duodenal stenosis resulting from ulcer, and general conditions causing atony, such as general debility from hæmorrhage and the like.

In uncomplicated duodenal ulcer there is a well-known increased initial motility, i.e., early and free pyloric outflow. With stenosis motility is retarded and there may be a six-hour retention. Cap deformity is by far the most valuable and constant diagnostic indication of duodenal ulcer. Callous ulcer situated in the first part of the duodenum is impossible without characteristic and persistent anomaly as to the form of the cap, and is at times added to by spasm. A perfect cap means no callous ulcer. Deformity may also occur as the result of adhesions not due to ulcer. The contention that small ulcers can exist without cap deformity is in dire need of illumination through illustrated specific case reports. Certain peculiarities of gastric peristalsis occur in uncomplicated duodenal ulcer, which were not anticipated before the advent of the X-ray. We have heretofore known of but one clinical condition resulting in visceral hyperperistalsis, namely, stenosis.

In uncomplicated duodenal ulcer, gastric hyperperistalsis occurs immediately or shortly after the ingestion of the contrast meal, not only without stenosis distal to it, but with a decrease in the resistance normally offered by the tonus of the pyloric sphincter. Mills thinks that all indications are unfavorable, to the idea that the pain of duodenal ulcer is due to hypertension in either stomach or cap, the so-called adequate stimulus of visceral pain, but that it is due rather to the nerve-endings in the ulcer-floor becoming actually and abnormally sensitive to excess of hydrochloric acid.

ALBERT MILLER.

Woolsey, G.: The Surgical Treatment of Gastric and Duodenal Ulcers. *Med. Rec.*, 1916, lxxxix, 592.

Woolsey advises a thorough trial of medical treatment for gastric and duodenal ulcers, and states that acute ulcers will almost all yield to it, only cases of perforation requiring surgical treatment. The symptoms due to chronic ulcer will in time subside with or without treatment. But relapse is the rule and there is some question whether medical treatment gives a permanent cure.

After two or more relapses have occurred surgery should be resorted to. Gastro-enterostomy is the operation of choice. It affects both the drainage and the chemistry of the stomach: the acidity is diminished by the presence of a small quantity of bile and pancreatic secretion; the pylorospasm is relieved and the stomach empties itself without irritation of the ulcer by the passage of food. Healing occurs in 82 per cent of cases (Paterson). Symptoms will persist if due to adhesions or malignant degeneration. Gastro-enterostomy is not a certain preventive of perforation or hæmorrhage, but it diminishes the probability of their occurrence. On account of the anatomical structure of the duodenum, ulcers of the anterior duodenal wall can be overlooked and search should also be made for the not infrequent contact ulcer on the posterior wall, which is more indurated and of the gastric type. Cases where the pylorus is stenosed give the best late results.

The various methods of operation are: (1) Von Eiselsberg's, the most radical, in which the stomach is divided proximal to the ulcer and both ends sutured; (2) Wilm's, in which a band of fascia half an inch wide is fastened tightly around the stomach proximal to the ulcer; and (3) the method of infolding the pyloric end by suture.

Since duodenal ulcer almost never undergoes malignant degeneration, gastro-enterostomy with or without pyloric exclusion gives excellent results. It is different in callous gastric ulcers, which not infrequently become malignant. It is sometimes impossible to differentiate between an indurated ulcer and a carcinoma. A radical removal of the chronic ulcer is best in such cases.

The two complications of gastro-enterostomy, vicious circle and peptic jejunal ulcer, usually of the stoma, are avoided by proper technique. The author uses fine chromic gut for both suture layers.

The more radical operations for gastric ulcer are: excision, pyloric resection, and mesogastric resection. Excision is not a satisfactory operation. Resection is more radical but gives better results.

In ulcers of the pyloric region of the stomach, the Billroth method is the operation of choice; it should be followed by gastro-enterostomy, or the Plya-Reichel modification in which the proximal end of the stomach is sutured directly to the jejunum. The chief technical difficulties are due to adhesions, especially in case of a penetrating ulcer. When the ulcer is farther from the pylorus, usually on the lesser curvature, the mesogastric resection, or resection in continuity is the operation of choice. The mortality of resection is greater than that of gastro-enterostomy, but the operation is well borne and the mortality not high. In all cases of gastric or duodenal ulcer the patient should be put on a special diet for some time after operation.

The so-called hour-glass stomach which results

from a cicatricial contraction of a gastric ulcer is treated on the same principle as callous ulcers.

The two complications of gastric and duodenal ulcers are hæmorrhage and perforation. Sudden acute hæmorrhage is usually due to acute ulcer and is best treated medically. In recurring hæmorrhages with threatened severe anæmia, operation should be done before the anæmia progresses. In cases of dangerous hæmorrhages direct transfusion of blood is of great value. In acute perforation early diagnosis and immediate operation are most essential.

Subacute and chronic perforations result in perigastric and subphrenic abscesses, which demand accurate diagnosis to indicate the operation suitable to the case. L. R. GOLDSMITH.

Haines, W. D.: Some Features in the Management of Surgical Disorders of Digestion. *Lancet-Clin.*, 1916, CXV, 352.

The newer pathology has shown that the organisms of an infection occurring in the buccal cavity, the tonsils, or elsewhere, may be transmitted by the lymph or blood stream to remote parts of the body, there to form new foci when arrested in the terminal vessels of such organs as the gall-bladder, stomach, duodenum, brain, or kidney. According to these newer concepts, digestive disorders, gastric ulcer, cholecystitis, and appendicitis are to be regarded as terminal infections. Gastric and duodenal ulcer must be regarded not as a disease but as the end-result of a disease. To successfully cope with the symptoms the original source of infection must be removed. Pus must not remain unchallenged anywhere in the system.

The author is convinced that 70 per cent of digestive disorders may be cured by removal of some extragastric pathological condition, the source of the disorder being an overloaded colon, infection of the pancreas, gall-bladder, gums, sinuses, or tonsils.

The mortality following perforation of an ulcer increases by leaps and bounds after the first few hours, and immediate operation is imperative. The thick indurated mass associated with chronic prepyloric ulcer should be removed, but these patients are in such poor condition from prolonged starvation that they are poor surgical risks and the better practice is to do a two-stage operation: a primary gastrojejunostomy and a secondary resection after recovery from starvation. Occasionally one finds that the mass at the pylorus has entirely disappeared. In this case the second operation terminates as an exploration.

Hæmorrhage is a symptom difficult to relieve. Calcium chloride and horse serum may tide the patient over until an interval operation may be done. The discrepancy between the size of the ulcer and the amount of blood lost may be great. Perigastric adhesions are prone to undergo contraction with the production of obstructive disturbances in the stomach. When firm it is better to provide ample drainage for the stomach in preference to making extensive lacerations with the subsequent production of new adhesions. In the vast majority of instances separation of adhesions is but temporizing and permanent benefit may not be expected.

The author's experience with cancer of the stomach has been discouraging, but surgery is the only means by which life may be prolonged. It has been said that gastrojejunostomy tends to prevent the subsequent development of malignancy, but several cases are mentioned in which resection for perforation of a clinically benign ulcer was followed by cancer within the following fifteen months.

One-third of all cancers occurring in man are located in the stomach and the vast majority originate in the margin of an unhealed gastric ulcer. He who recognizes this and deals radically with the ulcer before malignancy has begun will add much to the sum total of human life and happiness.

E. K. ARMSTRONG.

Chislett, H.: Intestinal Adhesions. *Clinique*, Chicago, 1916, XXXVII, 152.

From the viewpoint of causation, the author's experience would seem to indicate the order of frequency to be:

1. Former attacks of inflammation of some intra-abdominal organ.
2. Injudicious manipulation and lack of tenderness in necessary handling of the intestines and other intraperitoneal organs during previous operations.
3. Traumatisms through contusions or wounds of the abdomen, including the too forceful reduction of herniæ, the improper application of truss pressure, and the injection treatment for herniæ.
4. The use of drainage after operations, either capillary or tubular.
5. Imperfect wound healing with resulting ventral hernia.
6. Idiosyncrasy—some patients seeming predisposed to the formation of adhesions even upon the most gentle manipulation.

The prevention of adhesions following operations upon abdominal organs depends upon the following factors:

1. Gentleness of manipulation in all necessary handling of tissues.
2. The avoidance of unnecessary exploration by more careful case taking and more accurate diagnosis.
3. The free exposure of the field by sufficiently large incisions, and especially by posture, to minimize the necessity of blind and blunt separation of adhesions.
4. The use of moist rather than dry packs, except when their retention may be demanded for protection.
5. The avoidance of drainage where possible.
6. The covering of all denuded areas.
7. The use of normal salt solution poured into the peritoneal cavity after completion of operation.

8. The early establishment of and continuance of peristalsis.

9. The assumption of a posture favoring the prevention of contact with sutures or ligated parts.

10. The frequent change in position of the patient.

11. The suture of the peritoneal wound with edges.

12. The covering of all denuded areas not amenable to suture with omental grafts.

13. The use of sterile omental oil rather than the normal salt solution where denudations cannot be properly covered. EDWARD L. CORNELL.

Fraser, J.: Enteric Intussusception. *Edinb. M. J.* 1916, xvi, 275.

Two cases are briefly reported in which intussusception occurred above the ileocæcal valve, complete recovery following operation.

In both, the symptoms were greatly similar, showing early colic-like abdominal pain, slight nausea, increasing constipation, rising temperature and pulse-rate, with abdominal distention and rigidity. In neither was the presence of blood per rectum noticed, and general prostration occurred early. The age of the first was three and one half years; that of the second ten years.

In the first case the intussusception was found about ten inches above the ileocæcal valve. This then was invaginated into the large bowel, the ileocæcal valve remaining at its apex. In the second case, the intussusception involved about twenty inches of ileum, extending to within twelve inches of the ileocæcal valve.

In both cases resection of the involved ileum was performed, followed by end-to-end anastamosis. In the first case recovery was complicated by acute parotitis and later by a condition resembling poliomyelitis; recovery however occurred. In the second, uneventful recovery took place.

The author emphasizes the age, the gradual onset, and the absence of blood per rectum. The latter is almost diagnostic of enteric intussusception.

P. M. CHASE.

Johnson, J. E.: Conclusions in the Study of Intestinal Stasis. *South M. J.*, 1916, ix, 342.

The author traces his experience with cases of intestinal stasis, beginning at the stage where the appendix alone was removed to what he terms the "blackest page of disappointment" in this endeavor, the mechanical correction of the various ptoses and kinks discovered in this condition. Finally comes the physiologic stage, which offers most hope for the proper understanding of this condition.

There are three sphincters in the gastro-intestinal tract: the pylorus, the ileocæcal valve, and the anal sphincter. The function of the pylorus is to hold food in the stomach a proper length of time — 4.5 hours — for its preparation for intestinal digestion. If held longer by obstruction or spasm of the pylorus it becomes putrefied and the intestine consequently absorbs bad food. The cæcum is the cesspool of the intestinal tract. If the ileocæcal valve be incompetent, there is regurgitation and the patient literally feeds on his own excreta.

The author points out the effect of irritation on one of the sphincters in its relation to spasms of the sphincter higher up. The most common example is pylorospasm due to chronic appendicitis. This condition will cause a "delay toxæmia," the points of diagnosis of which are repeated soreness in the right side preceded by toxic headaches without colic. In advanced cases of this type there is a thickened terminal ileum and a distorted, infected colon; a right-sided colectomy is the only remedy of avail in such cases.

The toxæmia of ileocæcal regurgitation is quite different from the toxæmia of delay. The former is the cause of visceroptosis (through toxic paralysis of the splanchnic nerves) and the formation of inflammatory membranes due to bacterial invasion of the walls of the intestine. The cure for ileocæcal regurgitation is a plastic operation described by the author in a previous paper for the re-establishment of the function of the ileocæcal valve. E. FISCHEL.

Hubeny, M. J.: Roentgen Examination of the Appendix. *Illinois M. J.*, 1916, xxix, 109.

Roentgen examination has eliminated some of the possible errors in the diagnosis of chronic appendicitis. Hubeny gives some of the confirmatory data which with the clinical findings warrant this diagnosis.

The fluoroscopic examination is the most satisfactory, and visualization of the appendix is preferably made by opaque meal.

It is necessary that the appendical lumen be patent, otherwise the appendix may not be demonstrable.

Some observers think that every appendix which permits the entrance of an opaque meal is pathologic; however, if the appendix empties itself at the same time as the cæcum it must not be so considered.

Adhesions are considered as pathological evidence of previous inflammations. These may be fluoroscopically recognized, particularly if extensive; contractions due to stricture of the lumen and other results of a diseased condition can also be demonstrated. Much information may be derived from the size and other conditions of the visualized appendix.

Since it is well known that aside from gastric ulcer chronic appendicitis is the most frequent cause of spasmodic hour-glass constriction of the stomach, this, as well as other effects on remote organs, may be looked for. HOLLIS E. POTTER.

Morris, R. T.: Fibroid Degeneration of the Appendix. *J. M. Soc. N. J.*, 1916, xiii, 120.

Among four well-defined types of appendicitis, fibroid degeneration appears to furnish the commonest lesion. It is an irritative lesion, not infective.

Individuals of the asthenic group presenting a

number of stigmata of decline appear to have fibroid degeneration of the appendix more frequently than do other individuals of normal development. Patients with enteroptosis and with the features of arrested development belonging to visceroptosis are prone to include symptoms of fibroid degeneration of the appendix, along with their other symptoms.

The signs which belong to fibroid degeneration of the appendix, the irritative lesion, the commonest form of appendix trouble, are:

1. Transitory pain and discomfort in the appendiceal region, not sufficiently severe to send the patient to bed, and extending over many years.

2. Hypersensitiveness of the right group of lumbar ganglia, determined by making deep pressure upon the abdominal wall about an inch and a half to the right of the navel and a little below that point, not accompanied by similar sensitiveness of the left group of lumbar ganglia.

3. Habitual distention of the ascending colon with gas.

4. Various gastro-enteric disturbances partly due to irritative influences from the appendix, and partly due to other features of neurasthenic habit or arrested development, such as sagging colon, loose kidney, and complications previously alluded to.

EDWARD L. CORNELL.

Dubose, F. G.: Neglected Appendicitis; Its High Mortality a Diagnostic and Therapeutic Responsibility. *South. M. J.*, 1916, ix, 332.

The unduly high death-rate from appendicitis, given in reports of insurance companies, as compared to the exceedingly low mortality from early operation in acute appendicitis makes it incumbent upon the physician to enlighten the laity upon the possible seriousness of what appears to be a "bellyache."

Under the title pathology, the author accepts and quotes freely from the report of Stanton. All cases represent merely different stages or degrees of inflammation. The second day is considered the most serious and Dubose says: "If it is going to occur at all, gross perforation of the appendix itself, with or without gangrene, usually takes place before the end of the second day." Attention is called to the conclusion Stanton reached denying the existence of catarrhal appendicitis as a pathological entity and affirming that bacteriological perforation occurs during the first few hours of the attack whether or not gross perforation of gangrene is present. Moynihan and Deaver are freely quoted in pointing to the direct connection between perforation and spreading peritonitis and pergation.

Under the heading symptomatology, after describing the usual well known symptoms and signs, the author states that the differential diagnosis lies not between acute appendicitis and acute indigestion, but between appendicitis and some other condition demanding surgical interference. It is only the neglected cases which demand most careful judgment as to when is the best time to operate. In coming to a decision the surgeon must always bear in mind that what has been done before he has been called and what can be done post-operatively have as much bearing on the ultimate outcome of the case as the operation itself. If a late operation is unavoidable, the author advises that the stomach be emptied and kept empty; that the large bowel be cleansed with enemata and be prepared for the use of proctoclysis; that morphine in sufficient quantities be given "to relieve pain, lessen peristalsis, diminish shock, retard absorption, limit tissue waste, and to favor the formation of protective peritoneal adhesions"; that the patient be put in Fowler's position and that proctoclysis of 15 per cent glucose, 1 per cent sodium bicarbonate, and 0.5 per cent sodium chloride be given. If operative delay be unavoidable the author gives in full his reasons for never administering a purgative, for withholding all nourishment by mouth, and for the administration of morphine.

In case more than forty-eight hours have elapsed between the onset and the time when the surgeon is called immediate operation is imperative (1) if all unfavorable symptoms become exacerbated in spite of the starvation-rest treatment; (2) if there be sudden relief of pain with subjective betterment but with a quickened pulse-rate indicating rupture of the appendix or of an abscess or of thrombosis; (3) if a circumscribed swelling appears in the right abdomen (evidence of localization of inflammatory process by adhesions); (4) if the previously high leucocyte count falls suddenly or gradually declines with a steady increase in the polymorphonuclears; (5) when more than one week has elapsed since the onset.

Operation should be deferred from the third to the seventh day after onset, long enough to give the starvation-rest treatment a chance, and should be deferred as long as the patient shows improvement under this treatment; in the presence of a blood-count which shows a high polymorphonuclear count without a corresponding leucocytosis, which is indicative of intense infection or of a patient with low resistance so overwhelmed that a fatal outcome is to be expected under any treatment. The benefits derived from delay are the recovery of the sympathetic nervous system from shock; the blood is given time to form antibodies and the peritoneum is allowed to form limiting adhesions. The dangers in postponing operation are: further saturation of the system with toxins, especially in the presence of a gangrenous or obstructed gut; bacterial invasion of the blood stream; lymphatic infection with resultant empyema, subphrenic abscess, multiple abcesses of the liver or cholecystitis; progressive suppurative peritonitis.

Of the factors influencing the outcome, rational pre-operative treatment is the most important in favorably influencing the result of operation. The anæsthetic of choice is nitrous-oxide-oxygen, alone or combined with infiltration. The operation should be well planned. The author describes an

incision which he has proved to be very satisfactory. The skin is incised transversely through McBurney's point; the aponeurosis and muscles are divided in the usual way and the peritoneum opened; if more room is required, the fused aponeurosis at the outer border of the rectus is cut and extended downward, thus permitting a triangular flap to be raised and as extensive an exploration as may be desired. Every pus pocket is opened and drained; the appendix is removed in every case where at all feasible, and thrombosed or gangrenous omentum is likewise excised. Sheets of rubber tissue or gauze wicks covered with rubber tissue are used for drains. The author believes that today the errors of appendiceal surgery result largely from timidity or conservatism, due to a lack of understanding of the pathology underlying the picture.

At the close of the operation hypodermoclysis is given supplemented by proctoclysis; the patient is placed in Fowler's position, and morphine in sufficient quantities to relieve pain is administered hypodermatically. Stomach lavage should be used every four to six hours, and where duodenal contents are regurgitated, the stomach contents obtained by lavage are re-introduced in the proctoclysis. Essence of pepsin, one teaspoonful to a quart of water, is administered per rectum to relieve gas. Pituitrin is used for distention after the third day, when it is first permissible to stimulate peristalsis. Milk and molasses, equal parts, are the safest ingredients for an efficient purgative enema. The routine use of strychnine, caffeine, spartein, nitroglycerine, and strophanthin is condemned. Morphine, atropine, and pituitrin have distinct indications and are valuable when properly used. Glucose and soda administered intravenously make an ideal heart-muscle stimulant, besides affording nutriment and acting as aids to the elimination of toxins. The post-operative care is equally as important as the operation. E. FISCHEL.

Andries, J. H.: The Choice of Time for Operating in Acute Appendicitis and Gall-Bladder Disease. *J. Mich. St. M. Soc.*, 1916, xv, 182.

In acute appendicitis early operation is the best and oftentimes the only chance of a cure. If the patient is not seen until the third day or later, it is best to postpone operative treatment until the abscess is circumscribed and localized. The danger to the life of the patient is greatest if operation is performed on the third or fourth day. After the fifth day there is no longer any danger if it is treated simply as an abscess. If pneumonia complicates acute appendicitis the outlook is poor and the condition had best be treated non-surgically until the pneumonia subsides.

Appendicitis during pregnancy is also a very grave condition, the more favorable cases being those that are operated upon during the first few hours of the attack. In every case of appendicitis in the female the physician should satisfy himself as to the possibility of pregnancy, as such a complication is always a hazard to the patient's life.

In gall-stone disease early operation is contra-indicated only by the presence of some condition in another organ which would constitute a hazard to the patient's life. Early operation is not accompanied by danger providing the patient is otherwise in good condition. Delay means courting advanced pathology and complications. Should infection of the gall-bladder be present operation is contra-indicated if the temperature is above 102°, except in those cases of greatly distended gall-bladder where rupture is imminent. Here all that is necessary is incision and drainage, removal of stones by any method under these circumstances being dangerous.

Thus it is seen that in both affections the choice of time for operation runs parallel, an early operation being necessary to avoid progressive pathology, to lessen the difficulty and seriousness of surgical treatment, and to minimize the danger to the patient's life. E. K. ARMSTRONG.

Wiener, J.: Appendectomy Under Local Anæsthesia. *J. Am. M. Ass.*, 1916, lxvi, 1078.

The technique which the author employs is as follows:

Half an hour before the operation the patient receives a quarter of a grain of morphine hypodermatically. A 1 per cent solution of novocaine is used, to an ounce of which is added 20 drops of 1:1,000 solution of epinephrin. As much as 240 minims of this solution can be safely used for an adult, which would correspond to about 2.5 grains of novocaine. As a matter of fact, the author has never found it necessary to use anything like that amount to do a painless appendectomy.

The muscle-splitting McBurney incision is used in most cases, acute as well as chronic. This incision is particularly adapted to the operation under local anæsthesia. The skin near the anterior superior spine is not very sensitive; but by far the greatest advantage of an incision in this location is the fact that it comes directly down on the cæcum. Rarely is it necessary to pack away the small intestines (although this can readily be done without causing pain), and there is thus less handling of the intestines. The novocaine is first injected into the skin along the line of the proposed incision. In doing this the author tries to blanch the skin with the injected solution. Then the novocaine is injected *under* the skin along the same line.

After a wait of three minutes, the skin and subcutaneous tissues are painlessly incised down to the aponeurosis of the external oblique. A sharp scalpel is used for dividing all layers, as scissors, being blunter than a knife, are more apt to cause pain. Next novocaine is injected under the external oblique aponeurosis and after two minutes that is divided. The solution is next injected into the internal oblique muscle, parallel to the fibers of the muscle.

After another wait of a few minutes, the internal oblique is cut parallel to its fibers. A little novocaine is then injected under the peritoneum and an interval of fully three minutes is allowed to elapse before dividing it. If done in this way, there will be no pain up to this point. All manipulations should be as gentle as possible. It is rarely necessary to apply artery forceps in opening the abdomen through this incision, which is an additional advantage, as the crushing of the blood-vessel with forceps may cause some pain unless the novocaine is injected around the vessel. If necessary, a packing can be introduced to keep the small intestines out of the way, although it is rarely necessary with this incision.

As soon as the cæcum with the appendix is exposed, some novocaine is injected into the mesenteriolum. If this is not done, the patient will complain of cramplike abdominal pain referred to the navel or pit of the stomach. By anæsthetizing the mesenteriolum, this pain is obviated. After a wait of three minutes, the appendix can be pulled out of the abdomen, the mesentery ligated and divided, and the appendix removed with almost no pain. It is not necessary to inject novocaine into the base of the appendix before ligating and removing it. If the mesenteriolum is properly anæsthetized, there will be no pain during the removal of the appendix. It is perfectly feasible to draw the right tube and ovary into the wound and do any operation on them that may be indicated.

The abdomen is closed layer by layer in the usual manner and, if the technique has been correct, the closure of the wound will be entirely painless.

EDWARD L. CORNELL.

Landsman, A. A.: Anorectal Fistula. *N. Y. M. J.*, 1916, ciii, 829.

The author treats anorectal fistula from the standpoint of the anatomy of the pelvis and ischiorectal fossa, and maintains that the condition in practically every case is preceded by a suppurative focus, which in burrowing into the bowel or any viscus, between the layers of the endopelvic fascia, or out on the skin surface, simply follows well-recognized physical laws, and should accordingly be looked for in situations where gravity and diminished resistance of the tissues combine to favor its production. Hence internal openings of fistulæ are met with at the junction of the two sphincters, while external openings, when the abscess ruptures through any portions of the ischiorectal space, have been found in the author's experience, in the posterolateral angle of the fossa.

Abscess of the pelvic or anoperineal region results in fistula primarily because of failure to drain promptly, thoroughly, and efficiently, or because of careless or unskillful after-treatment, or both, favored by natural conditions in this region, which interfere with rest and cleanliness, so necessary in wound repair in other situations.

It is evident from the above that the successful operative treatment of fistula depends, in a general way, upon the production of favorable surgical conditions, followed by suitable after-care.

Saphir, J. F.: Ischiorectal Abscess from a Fish Bone. *N. Y. M. J.*, 1916, ciii, 784.

A man, aged 34, swallowed a fish bone and three days later developed chills and fever. He was operated upon in two weeks for ischiorectal abscess, but the fish bone was not removed. The fistulous tract returned in six weeks. At the second operation the bone was removed by the author.

The points of importance that stand out in the care and treatment of fistula cases are as follows:

1. The necessity for early diagnosis.
2. The necessity for more frequent rectal examinations on the part of the family physician.
3. The necessity for complete and more thorough laying open of the canal and probing the affected area for branch canals, pockets, and foreign bodies.
4. The necessity for trimming off the edges of the wound to prevent bridging and too hasty healing.
5. The necessity for keeping the wound clean and properly drained to prevent infection.
6. The sphincter can be cut without causing incontinence if cut at right angles to the muscular fibers.
7. The ability to get along without locking up the bowels for a week, without the use of opiates, and without the use of the barbarous rubber hose.

EDWARD L. CORNELL.

Hoeve, H. J.: Complete Removal of the Intestinum Rectum and Colon Pelvinum for Carcinoma. *Internat. J. Surg.*, 1916, xxix, 35.

The author briefly discusses the subject of carcinoma of the rectum and sigmoid and reports a case of complete removal of these structures. He emphasizes the necessity of a thorough rectal examination in all cases showing lower bowel symptoms.

The theory of Park and Behla that cancer is an infectious disease due to a parasite belonging to the chytridiaceal, i.e., a vegetable organism on the borderland of the vegetable and animal kingdoms, is considered by Hoeve to be the most plausible.

In accordance with the opinions of Lusk, Edebohls, and the Mayos, the author strongly advocates the abdominal route in the removal of the rectum and sigmoid as giving better exposure and a cleaner removal of all the glands and surrounding tissue usually involved. Colostomy is done either in the left iliac region or through the left rectus muscle. Contra-indications for operations are metastases into the liver, involvement of the seminal vesicles, the prostate, or the base of the bladder, the parametrium and the ovaries in the female, and poor arterial development of superior hæmorrhoidal and inferior sigmoidal arteries.

The case reported is that of a male, colored, age 46, complaining of excruciating pelvic pains, paroxysmal in character, loss of weight, weakness, and general debility. On examination, total occlusion of

the rectum was found, extending upward from the prostate for about five inches. The mass was hard and bled easily. No enlarged glands were palpated.

Median abdominal section was performed, but no liver metastases and no glandular involvement were found, the growth being entirely extraperitoneal. The bowel was severed well above the mass, sterilized by phenol and alcohol, and closed by purse-string sutures. The rectum was freed by blunt dissection and the perirectal tissue completely removed. The rectum was then cut at the internal sphincter which was touched with phenol and alcohol. The cavity was drained through the anus by a large rubber tube; a small tube was inserted through an opening posterolateral to the anus and a few strips of iodoform gauze inserted, after which the abdomen was closed.

On the third day bacillus coli infection developed which was checked by irrigation through the anal tube, but the patient died on the eighth day. No post-mortem was obtained.

The pathological diagnosis was adenocarcinoma of the rectum. P. M. CHASE.

Morley, A. S.: The Treatment of Hæmorrhoids by Injection. *Lancet*, Lond., 1916, cxc, 617.

The obvious advantages of the treatment are: (1) that the patient need not be confined to bed for more than 24 hours, at most; (2) that there is no need for general or local anæsthesia since the treatment is practically painless, if properly performed; (3) that it can be made quite inexpensive, so much so that it may be brought within the reach of even a poor patient who certainly could not face the expense of an operation in a hospital; (4) that it is a perfectly safe procedure in such patients as the very aged, pregnant women, and others, who for some reason cannot take an anæsthetic safely, such as persons with dangerous heart or lung diseases; (5) that there is no after-pain; and (6) that it is invariably harmless.

The treatment is not suited to cases of strangulated or irreducible hæmorrhoids nor to cases in which there are other complicating conditions, such as old-standing fissures, fistulæ, ulcers, etc.

The treatment consists of the injection into each internal pile of a few drops of carbolic acid and glycerine. The following solution is employed:

Acid, carbolici	gr. xlviii
Glycerine	dr. ii
Aquae destillat	dr. ii

The amount which should be injected into each pile varies from 2 to 6 minims of this solution. Inject all the piles at one sitting whenever it is possible to do so. It is easiest and best in every way to perform the injection through a large speculum. The one most suitable is Kelly's sphincteroscope. The other needful appliance is a suitable syringe.

Before making the injection, the piles may be sponged over with a little weak biniodide of mercury or 1/50 lysol solution, which should be mopped up at once with a dry swab to prevent risk of absorption. It is a good plan also to touch each pile at the spot where it is proposed to inject it with a drop of pure carbolic.

The patient should be instructed to keep quiet, in bed if possible, for the first 12 to 24 hours, and to wash the piles at once with cold water should they prolapse and then to grease them well with vaseline or some simple ointment and gently press them back. Where the piles are large, as many as four or five injections at weekly intervals may be required, but, as a rule, two or three are sufficient.

EDWARD L. CORNELL.

Edwards, F. W.: The Treatment of Hæmorrhoids by Injection. *Lancet*, Lond., 1916, cxc, 819.

The author refers to the fact that Van Buren was one of the first to advise the treatment of hæmorrhoids by injection. He has tried out the method in some hundred cases and seems well satisfied with the results. Except in two cases there was no pain. One injection sufficed to cure some, but the majority required two or three. It failed in one or two cases, which later required excision and ligation. He uses 20 per cent carbolic acid in equal parts of glycerine and water. Having protruded the piles, the patient is placed in the knee-elbow position and an injection of from 3 to 6 minims of the carbolic solution is made into the center of each pile. In some of the larger piles he injects 5 minims in two places. The piles are then well smeared with vaseline and replaced as soon as possible, for the injection always causes the hæmorrhoids to swell. Bowel movements are prevented for forty-eight hours, and should prolapse occur in the meantime, immediate replacement is necessary.

He emphasizes the importance of protruding the piles before attempting the injection and gives as his reason the following: (1) It is much easier and one is more certain of getting into the center of each pile. (2) If the piles are injected through a speculum a special long syringe is necessary, whereas an ordinary hypodermic syringe suffices when the piles are prolapsed. (3) Piles which cannot be protruded should be left alone. They are to be cured by palliative means, such as local applications, enemata, attention to diet, regulation of the bowels, etc. (4) An assistant is almost a necessity if a speculum is used, and should any bleeding occur on the withdrawal of the needle, is indispensable. He does not believe that this is as likely to take place as when the piles are prolapsed, but it might occur, when an extra pair of hands would be useful.

Cases fitted for injection are those of uncomplicated internal hæmorrhoids which can be protruded, then returned and kept within the bowel, so that comparatively few cases are fitted for the injection treatment. For instance, he cites 11 cases in a day's experience in his clinic in which 10 were complicated by other lesions: 4 with fissure, 4 with external piles, 1 with an anal ulcer, and 1 with a thrombosed internal pile. After the injection a few hours

in bed are advisable, after which the patient can walk about and attend to his usual occupation.

The great advantages Edwards sees in the injection treatment are: (1) no confinement to bed excepting for a few hours when possible; (2) no anæsthetic is needed, therefore, there is no post-anæsthetic vomiting; (3) no pain; (4) no enforced absence from business; (5) no risk from the little operation itself and no risk of stricture or incontinence following; and (6) immediate and steadily increasing betterment.

As regards operative treatment, he is a strong advocate of the ligature operation and condemns the Whitehead operation. DONALD C. BALFOUR.

Burrows, W. F., and Burrows, E. C.: A New Hæmorrhoidal Operation: the Snare and Bullet. *J. Am. M. Ass.*, 1916, lxvi, 871.

The hæmorrhoidal operation described is simple, rapid, free from danger, suitable for the use of local anæsthesia, and has been used in a series of 60 cases.

The instruments required are a hypodermic syringe and local anæsthetic, half a dozen artery forceps, two pairs of scissors—one pair for cutting the wire, four or five strands of strong pliable wire—both ends of each strand threaded through a perforated lead bullet, and a bullet holder and crusher. The operation resembles most the ligature method, but is cleaner, more thorough, and more quickly carried out than the latter. The pile can be cut away closer to the snare than to the ligature and the snare and bullet finally lie at a higher level than does the ligature which the fingers must get into the anal canal to tie, a procedure that is difficult.

The tissues to be removed are thoroughly anæsthetized with the local anæsthetic fluid, and an incision is made below and to either side of the extro-internal hæmorrhoid, extending into the rectum and dividing the deeper tissues in somewhat the form of a V-wedge. A pair of forceps, previously applied to the tissues to be removed, is used to exert gentle traction on the parts, exposing more of the rectal mucosa proper. A second pair of forceps is placed on the rectal mucosa and again traction is made on the mass and the lateral incisions are extended inward to the degree desired. Above the last pair of forceps a transverse incision is made in the mucous membrane, a point of some importance since it is in this slit that the wire will sink and prevent slipping. A wire loop threaded through the perforated bullet, and its free ends held in a clamp, is then slipped over the handles of the forceps attached to the hæmorrhoid and the loop placed in position with the forefinger. While the wire loop is kept taut, the bullet is grasped by the bullet holder and crusher and forced down on the mucosa to either the skin or mucosa side of the pedicle (preferably the latter), thus tightening the snare. The bullet forceps are closed with pressure and the lead bullet made to collapse on and hold the taut wires where they pass through it, securing the snare in proper position. The excess of the pedicle is cut away and the wires are severed flush with the bullet.

When extensive prolapse of the rectal mucosa accompanies the hæmorrhoids, the technique is somewhat changed. The "pile" mass is freed in the same manner, but the wire, threaded on a curved needle, passes first transversely through the rectal mucosa above the corresponding hæmorrhoidal area. One half of the wire is already threaded through a perforated bullet; the other then encircles the "pile" pedicle and passes through the same bullet. The mucosa is incised superficially so that the wire will become embedded when tightened, and the hæmorrhoid is cut away. Others present are removed in the same manner, usually three in all, and a small gauze drain is placed in the rectum.

Most of these patients are operated on in the office; but if coming from a distance, or if the condition is complicated with bowel prolapse, they remain in the hospital from 24 to 36 hours.

It is not necessary to pack the rectum or to insert plugs, which cause discomfort while in place and pain on removal. Sutures are not used, but healing takes place by granulation and secondary union. Repair is complete in from two to three weeks. The snare and bullet may come off the fourth day, but usually the fifth or sixth.

EDWARD L. CORNELL.

Bell, F. M.: Bloodless Operation for Hæmorrhoids and Prolapsus Ani. *Brit. M. J.*, 1916, i, 415.

The following operation is designed for use in any case in which the Whitehead operation is indicated. After dilatation a silk suture is passed at the junction of the skin and mucosa in the midperineal line and one on either side, so that when traction is made the extruded mucosa assumes a triangular shape. Each side of the triangle is then successively clamped, the furrow left after removal of the clamp marking the area for suture. This latter is placed at the apex of the triangle, using silk with a Hagedorn needle at both ends, and then continued as a cobbler's stitch to the lower end of the triangle where it is tied. The redundant tissue is then cut away and the fresh edges lightly touched with the cautery. The other two sides are similarly treated and the traction sutures are removed. This operation has the advantage of being almost bloodless and less liable to complications. E. K. ARMSTRONG.

LIVER, PANCREAS, AND SPLEEN

Deaver, J. B.: Operation for Removing the Gall-Bladder. *Ann. Surg.*, Phila., 1916, lxiii, 415.

The type of operation which the author employs is described as follows: With the abdomen opened, the gall-bladder and right free border of the gastro-hepatic omentum are freed. In case there are adhesions, the region is thoroughly walled off. The edge of the liver and the fundus of the gall-bladder are grasped with the left hand, carrying a

piece of moist gauze, and are pulled downward, outward, and then upward, making the cystic duct and the free border of the gastrohepatic omentum taut. A small incision is made through the upper part of the border of this omentum and the duct exposed. It may now be clamped at its junction with the gall-bladder. and cut across distal to the clamp with the cautery. The common duct can readily be explored by passing a probe through the stump of the cystic duct into the duodenum. Before the probe is removed, the duct is palpated between the fingers and thumb of the free hand, so that no stone is overlooked. The cystic artery lying above and to the inner side of the cystic duct is next clamped and cut. If it is not necessary to drain the common duct, the stump of the cystic is ligated and next the cystic artery.

The gall-bladder is freed from below upward. This is done step by step following closely with a continuous suture of catgut which passes through the liver tissue forming the sides and floor of the gall-bladder bed. In this way, the operation is a bloodless one and the author regards it as superior to packing with gauze or to placing a cigarette drain in the cavity left behind. The divided layers of the gastrohepatic omentum are sutured, not covering in the stump of the cystic duct. A small rubber tube is placed just beyond the free border of the gastrohepatic omentum, and is left for four or five days. Should the stump of the cystic duct leak bile, this tube may be left in place longer.

GATEWOOD.

O'Brien, F. W.: The Present Status of Gall-Stone Diagnosis by the Roentgen Ray. *Boston M. & S. J.*, 1916, clxxiv, 309.

O'Brien reviews the literature, paying particular attention to the works of George and Cole. In his own work O'Brien uses a fast, finely-grained, intensifying screen in all gall-bladder work. The advantage of employing screens is that of time as well as intensification. It is fundamental in this work that the patient should not breathe during the exposure. Stout individuals may find it difficult to hold the breath even for a second, hence the reason for speed. The screen, too, will catch more surely the markings of the so-called soft gall-stones. It is again of special value in the robust and corpulent where a long exposure on an unscreened plate would give rise to so much secondary radiation that the gall-stone shadows would actually be lost in the fog.

The position of the tube will depend upon the position and size of the patient but usually it is in a plane parallel to that of the patient's body. A small diaphragm and a small cone are very important factors in the successful search for gall-stones.

One objection to the diaphragm and small cone is the liability to overlook stones in an abnormally placed gall-bladder so that it is well not to confine the search for stones to the commonly accepted location for them. They may be found anywhere in the lower or upper right quadrant and even to the left of the median line.

The importance of using a satisfactory developer need not be mentioned. More than that, one may with advantage overdevelop certain plates while giving others their normal developing time. Plates that are too dense to be read may be reduced and in that way gall-stone shadows may be detected in the process of reduction that would not be likely to be found in any other way.

The plates should be read only when thoroughly dry. Direct illumination by the northern sky is often particularly helpful.

That experience is a tremendous asset to successful diagnosis is attested by the number of roentgenologists who, under the impetus of the recent advances in gall-stone diagnosis, have gone back over their old plates of the gastro-intestinal tract and gall-bladder region in which they have reported no evidence of gall-bladder calculi, only to find on restudy very definite evidence. DAVID R. BOWEN.

Petersen, W., Jobling, J. W., and Eggstein, A. A.: Serum Changes and the Cause of Death in Experimental Pancreatitis; Studies on Ferment Action. *J. Exp. Med.*, 1916, xxiii, 491.

Incidental to a study of the ferment balance of the serum during various pathological conditions the authors had occasion to observe the serum changes in a series of eighteen dogs in which an acute experimental pancreatitis had been produced.

From the series of experiments the authors believe they are justified in assuming that death was caused by the sudden flooding of the blood stream with the higher split products formed at the expense of the pancreatic tissue, of which the proteose increase was an index. Except in the experiments in which they used trypsin for injection there was no increase in serum protease at any time, as would have been expected if the intoxication had been a true trypsin shock, nor was there much change in serum lipase (esterase), the condition in this respect resembling closely the results observed following the injection of protein split products. From this study the following summary is given:

1. The serum changes observed during acute experimental pancreatitis indicate that the shock and death are due to an intoxication from protein split products, and not to an intoxication from pure tryptic ferment.

2. When the pancreatitis is produced by the injection of an antiproteolytic substance (sodium oleate), the degree of intoxication bears no relation to the degree of tissue destruction.

3. The increase in serum antiferment apparently favors the recovery. GEORGE E. BEILBY.

Levy, I. H., and Kantor, J. L.: The Incidence of Visceroptosis. *Boston M. & S. J.*, 1916, clxxiv, 534.

Visceroptosis, in the sense that the organs assume a lower level in the abdomen than we are in the

habit of calling normal, is, in the opinion of the authors, in a large majority of cases a congenital condition or a reversion to a more primitive type of development. Their conclusions are based on a study of 1,600 patients complaining of digestive disturbances, 898 of which were subjected to a routine roentgen examination. All stomachs in which the lowermost point reached more than one inch below a line between the iliac crests were included in the ptotic classification. On this basis, of the cases examined by the roentgen ray 64.4 per cent had gastroptosis. The condition was slightly more frequent in women than men, and in individuals under forty years than over that age, in both males and females. It occurred more often in single than in married women, and was associated with ptosis of the other viscera of the chest and abdomen in varying degrees in many of the cases.

Improper garments, occurrence of pregnancy, or any other incidental causes, play no part or at most only a very minor one in the production of the condition. The authors hold that it is intimately related to the structure of the body and probably arises from some congenital predisposition. Ptosis in itself is not a disease. Mild degrees of it may, under certain circumstances, cause symptoms, whereas marked types need not necessarily impair the functions of the affected organs. A. HARTUNG.

SURGERY OF THE EXTREMITIES

DISEASES OF THE BONES, JOINTS, MUSCLES, TENDONS. CONDITIONS COMMONLY FOUND IN THE EXTREMITIES

Henderson, M. S.: Loose Bodies in the Knee-Joint. *Am. J. Orth. Surg.*, Rochester, 1916, xiv, 265.

The author classifies loose bodies in the knee-joint as follows:

1. Fibrinous loose bodies, intrinsic in origin.
2. Bodies composed of organized connective tissue, e. g., bone and cartilage, intrinsic in origin.
3. Loose foreign bodies, extrinsic in origin.

He recommends that in the operation the most rigid asepsis be observed and usually a general anæsthetic is necessary. The incision may be laterally on either side or the patella may be split. The condylar incision is better for the removal of the meniscus. If the body is in the posterior part of the joint the incision described by Brackett and Osgood is the best. If the body eludes the surgeon, a second attempt at a later date is better than a too prolonged search.

The author's conclusions are as follows:

1. Fibrinous loose bodies are due to some diseased condition of the joint, and do not cause mechanical derangements.
2. Organized connective-tissue loose bodies produce mechanical derangements.
3. Loose bodies may have as their primary cause some condition such as osteo-arthritis or Charcot's disease but the secondary cause is direct or indirect trauma.
4. Osteochondritis dissecans is a group more or less distinct from the rest. The bodies seem to be produced by very slight indirect trauma.
5. Trauma, direct or indirect, is essential to the production of a loose body.
6. Surgery offers the only permanent relief, and the general condition of the patient being satisfactory the bodies should be removed.

PHILIP LEWIN.

Young, J. K.: A Case of Arrested Development of the Carpus and Tarsus. *Am. J. Orth. Surg.*, 1916, xiv, 221.

The author was unable to find a recorded case of bilateral club-foot and club-hand due to arrested development or from congenital absence of bony structures.

He reports a case of a ten-year-old girl with the condition, in which he thinks the arrest of development was probably caused by some acute infection, general in character but its exact nature unknown.

PHILIP LEWIN.

FRACTURES AND DISLOCATIONS

Skillern, P. G., Jr.: The Diagnosis of Fracture by Physical Examination Versus Skiagraphy. *Interst. M. J.*, 1916, xxiii, 256.

By obtaining a careful history of the mechanism of the injury and by a brief and gentle physical examination with the elicitation of true "wincing" tenderness, the diagnosis of fracture can be established in the great majority of cases without the aid of a skiagram.

The chief value of a skiagram consists in checking the extent of the deformity. A skiagram must be considered merely as one of the many signs of fracture.

It is more difficult to diagnose "contusion" and "sprain" than to diagnose fracture. Such diagnoses are often but cloaks to cover hasty and incomplete physical examinations, and should presuppose negative results following the exhaustion of every means at command to prove the presence of fracture. F. D. DICKSON.

Eikenbary, C. F.: The Fracture Problem. *Northwest Med.*, 1916, xv, 109.

The author in this general paper calls attention to the seriousness of every fracture. He lays stress upon proper alignment and its relation to function. Between the open and closed methods

of treatment he thinks there is a happy medium. He advises the open treatment in fractures of both bones of the leg or arm with irreducible over-riding; fracture of the femur with over-riding; fracture of the patella; and most fractures of the olecranon. If there is no infection, operation is indicated at once. Massage and manipulation should be begun at once in the closed, and after a few days in the open, operative treatment. In compound fractures he operates at once. In ununited fractures the bone-graft is recommended.

E. B. MUMFORD.

Rosenzweig, S. B.: The Causes of Prolonged Disability from Fractures. *N. Y. M. J.*, 1916, ciii, 640.

Rosenzweig urges that as much care be given to the prevention of prolonged disability after fractures as is given to the various operative procedures used in their reduction.

The causes of prolonged disability may be general or local. The general causes are less frequent. Among the most important are cachexias, as in tuberculosis and malignancy and the severe anæmias; circulatory disturbances, as in cardiorenal or hepatic diseases; nervous disorders, as in tabes, paresis, or myelitis. Old age is also important.

The local causes are divided into three groups: (1) amount of bone injury and damage to soft parts; (2) the sequelæ of poor reduction, malunion, delayed fibrous union and non-union, and excess of callus and its results; (3) the result of insufficient or improper care, such as pressure ulcers, muscular atrophy, ischæmic contracture, and adhesions within the joints and tendon sheaths.

LLOYD T. BROWN.

Henderson, M. S.: The Transplantation of Bone in Ununited Fractures of the Shaft of the Humerus. *Ann. Surg.*, Phila., 1916, lxiii, 464.

Henderson reports 10 cases of ununited fracture of the shaft of the humerus operated upon at the Mayo Clinic, with the following results. In 4 cases union was obtained at the first operation, in 3 a second was necessary, in 2 no data could be obtained as to the final results, and in one no union is known to have occurred. In 2 cases there was primary musculospiral paralysis produced at the time fracture occurred. In one no attempt to trace the nerve was made; in the other the severed ends were encased in a fascial tube made from the fascia lata, the operation being too recent to state the result. One case developed the same kind of paralysis at the time of operation from too vigorous retraction, but at the end of one year full function was restored.

He arrives at the following conclusions:

1. The transplant must be as large as is practical (6 inches by one-half inch or larger). It must extend well past the thinned decalcified ends into the hard healthy bone beyond.
2. The inlay is the method of choice.
3. Adequate post-operative fixation is necessary. A split plaster-of-Paris spica prepared a few days before operation can be fastened on with adhesive strips immediately after the operation is completed, thus eliminating the difficulty of applying the spica and the danger of disturbing the graft thereby. Two or three weeks later when the wound has healed, and the stitches have been removed, a new cast can be applied carefully with the patient sitting up.
4. By removing the bone-graft from the internal, flat surface of the tibia, the strong crest of the bone is left to perform its important weight-bearing function. The patient may be allowed to walk in from 12 to 14 days and by this time the blood-clot filling in the bony defect has become sufficiently organized so that no hæmorrhages will occur when the leg is used.
5. A properly applied spica cast may be comfortably worn for 3 months when in all probability union will be complete.

R. S. BROMER.

Hawley, G. W.: A New Method of Fracture Fixation. *Interst. M. J.*, 1916, xxiii, 277.

Hawley describes a method of clamping oblique or transverse fractures by means of wire in such a way that the wire may be withdrawn from the wound whenever desired without disturbing the fixation or making a fresh incision.

The instrument consists of a long, slender bar, a loop of heavy, woven, bronze, or ordinary picture wire, attached to a sliding clock and thumbscrew. The wire loop is designed to encircle the bone and engage the end of the bar to form a false knot. By turning the thumbscrew in one direction the loop can be tightened, and by turning in the other direction the loop is released and withdrawn. For application the fracture is exposed in the usual way and the apparatus applied after reduction of the fragments; the wound is then closed leaving the bar protruding, and dressings and a plaster cast are applied. The clamp may be left on as long as desired and withdrawn by loosening the loop and allowing it to slip off the end of the bar.

From experience in 17 cases the author concludes that the instrument has its field of usefulness in fractures where there is much tendency to displacement. A few cases have become infected, but only in a mild degree, and healing was without incident.

F. D. DICKSON.

Simmonds, B. S.: A Method of Treating Gunshot Fractures by an External Fixation Apparatus. *Brit. J. M.*, 1916, i, 481.

The author describes an apparatus for holding in apposition the fragments in compound fractures. By means of an aseptic operation he inserts into the bones at a distance from the seat of the fracture, screws which are long enough to project well beyond the skin and to immobilize the fragments by

means of a rigid plate fixed to the screws by nuts, the entire operation being done without interfering with the original wound.

The advantages of the method are: (1) the apparatus is simple and inexpensive; the operation is simple and easily performed; the original wound is not interfered with and healthy tissues are not extensively opened. LLOYD T. BROWN.

SURGERY OF THE BONES, JOINTS, ETC.

Cohn, I., and Mann, G.: A Further Study of Bone Repair. *South. M. J.*, 1916, ix, 235.

The authors give a report of studies in bone repair from experiments done within the last two and a half years. The literature since 1913 is reviewed and grouped into two schools: one in which claims are made that periosteum makes bone, and the other in which claims are made that periosteum plays no rôle in new bone formation. The conclusion from the study is that the periosteum is a means of protection against infection, a source of added blood supply, a limiting membrane, and its presence favors an earlier repair of defects, but the healing in its absence is bony nevertheless.

The authors found that free transplants of periosteum in the anterior chamber of a cat's eye did not live and produce bone. Free periosteum wrapped around the carotid artery showed no growth of bone. Resections of the fibula, subperiosteally, leaving the closed periosteal tube behind, gave no regeneration of the fibula from the periosteal sheath. The authors give a summary of the literature up to date in regard to callus formation. In 19 fracture experiments where the fibulæ in the same animal were broken simultaneously, one leg having the periosteum removed first and one having the periosteum remaining intact, showed repair in both cases. In the bone from which the periosteum had been removed the callus formation seemed to be greater than in the other, but not so far advanced in its development, up to 38 days after the experiment started. A series of experiments where a button was trephined from the bone subperiosteally and the periosteum sutured back into place again, in contrast to a case where the same operation was done but the periosteum was removed, showed that new bone was formed in each instance similarly, namely, that it seemed to spring from the medullary part of the bone, working toward the surface; only in the case where the periosteum was not removed, the repair was much greater in extent. In regard to the fate of small free bone transplants, uncovered by periosteum, the authors state that sooner or later these perish.

In regard to intramedullary transplants, the authors think that although osteogenesis on the part of the recipient bone is stimulated, yet the ultimate fate of the transplant is death. Protocols of the experiments with the appropriate bibliography are given in the original article.

Campbell, W. C.: General Heliotherapy in the Treatment of Bone and Joint Affections. *Am. J. Orth. Surg.*, 1916, xiv, 191.

The author used the sun treatment in 28 cases, in 8 of which sufficient time had not elapsed to obtain results. Of 4 with fistulæ improvement was rapid in 3, but for various reasons exposures could not be continued. Of the remaining 16 in which treatment was satisfactorily given, 7 were tubercular, 4 osteomyelitis, 2 pneumococcic arthritis, 1 periarthritis following direct infection of the knee-joint, 1 arthritis deformans, 1 decubitus.

He concludes:

1. That there is rapid expulsion of sequestra.
2. That there is marked and early beneficial effect in severe septic conditions.
3. That there is rapid evolution of the tubercular process resulting in bony ankylosis in every case.
4. That there is much difficulty in having the exposures regularly given in well-regulated general hospitals.
5. That close attention should be given to orthopedic measures for the prevention of the deformity as in any previous treatment, by using removable apparatus and extension.
6. That a decided advancement has been made, not only in the treatment of surgical tuberculosis, but in certain other affections of bones and joints.

PHILIP LEWIN.

Roberts, P. W.: The Influence of the Os Calcis on the Production and Correction of Valgus Deformities of the Foot. *Tr. Am. Orth. Ass.*, Washington, 1916, May.

In this paper attention is called to the importance of the os calcis as a basic factor in the cause of valgus deformities of the foot and as a medium through which weak-foot and moderate paralytic valgus can be controlled. The observations are based upon the principle that a body with an arc for its base can support a superimposed weight without tilting only when the thrust of that weight is received over the center of balance. It is shown that the under bearing surface of the os calcis is, on cross-section of the bone at its point of contact with a plane surface, an arc, and is therefore subject to the law just cited. It is further demonstrated that because of the firm ligamentous union of the os calcis to the rest of the foot any rotation of the heel bone must alter the strain on the longitudinal arch, raising it if the superior surface of the os calcis is rotated outward and depressing it if rotated inward. Therefore, by means of a plate designed for the purpose, weak-foot and moderate paralytic valgus may be controlled without any prop whatever under the arch. The same principle is applied in the surgical treatment of acquired varus.

Lord, J. P.: Arthroplasty of the Interphalangeal Joints. *Am. J. Orth. Surg.*, 1916, xiv, 212.

The author used free fat and fascia from the fascia lata to relieve some cases of stiff fingers and

some with congenitally contracted and pathologically dislocated fingers. He usually employed 1:400 novocaine locally and a tourniquet. It is necessary to control bleeding thoroughly before transplants are placed and the wound closed.

While his results were somewhat disappointing in the interphalangeal joints of the fingers, the majority of the joints were greatly improved, some to the extent that the patients were satisfied because the fingers became usable, whereas before they were almost useless.

Free full motion was obtained in none of the cases. Some joints, with a chronic arthritis, lingering and somewhat painful before operation, became painless afterward. PHILIP LEWIN.

Tarnowsky, G. de: The Heterogenous Bone-Peg; Its Possibilities and Limitations. *Surg., Gynec. & Obst.*, 1916, xxii, 610.

In view of the present well-generalized belief that all bony transplants are ultimately absorbed, the author was led to try sterile intramedullary pegs derived from the long bones of cattle. Sufficient time has not yet elapsed to permit of a positive statement regarding the exact interval which must elapse between the implantation and final absorption of the peg, but serial skiagraphs of operated cases show the bone to be slowly absorbing. Clinically the results have, in the main, been good. The callus, while tending to be excessive, has been firm and primary union has been obtained in all but one case.

The distinct advantages of the soup-bone pegs are: (1) they are easily obtainable; (2) they can be sawed or chiseled into any length or thickness; (3) they are easily sterilized; (4) they do not become brittle even after repeated boiling. The pegs are especially indicated in transverse or slightly oblique fractures as well as in fractures of the neck of the humerus or femur. They are less satisfactory in markedly oblique fractures or fractures with considerable splintering of the shaft.

Soule, R. E.: The Use of the Autogenous Bone-Graft Pin in the Treatment of Painful Flat-Foot, Paralytic Valgus, etc. *Tr. Am. Orth. Ass.*, Washington, 1916, May.

In his paper read before the American Orthopedic Association in Washington in May, 1916, Soule gives his observations from experience gathered in his investigations of painful foot disability over an extended period in orthopedic practice and emphasizes the fact that in acquired deformities of the foot the astragalus is seldom if ever displaced laterally. From his findings he has applied a new method of treatment to correct deformity and relieve pain and disability which is applicable to a very large percentage of such conditions. He cites 33 cases operated on, giving numerous illustrations of his cases before and after treatment, including painful pronated flat-foot, paralytic valgus, fracture displacements of the tarsus, and osteo-arthritis where he has applied arthrodesis of the astragaloscaphoid joint and autogenous bone-graft pinning of these bones with extremely satisfactory results.

The indications for this method of operating in flat-foot are:

1. Where other methods have failed to restore the foot to full function, painlessness, and normal contour after reasonable trials and a relapse toward the original deformity takes place.

2. Where bony prominences of the tarsus preclude the use of the rigid flat-foot plate and where pronation of the foot is a predominating part of the deformity as found in cases of relaxed pronated weak feet.

3. In cases of pronation of the foot with depression of the longitudinal arch as a result of fracture of the os calcis or astragalus, or displacement of the scaphoid.

In cases of pronation and valgus of the foot following infantile paralysis involving the anterior and posterior tibial muscles or a similar position in spastic paralysis.

In cases of osteo-arthritis of the foot where the predominence of pain is associated with the mid-tarsal joint with or without valgus or pronation.

The technique of the author's operation is as follows: With the foot and leg prepared for operation, preferably by the iodine method, and a tourniquet applied above the knee, an incision two and a half to three inches long is made on the dorsum of the foot, along the inner border of the tendon of the anterior tibial muscle from the bend of the instep. At the distal end of this incision it is curved inward and downward to expose the inner prominence of the scaphoid through which the bone-pin is to be inserted.

Through this incision on the dorsum of the foot the entire width of the astragaloscaphoid articulation is exposed.

The articular connecting ligaments of the entire width of the superior area of the joint are dissected away and the forefoot forced downward to expose freely the articular surfaces.

With the author's double curved gouge made to fit the ovoid of the head of the astragalus and the corresponding concavity of the scaphoid the entire articular cartilage is easily removed from both surfaces, preserving the ovoid of the head of the astragalus and the corresponding concavity of the scaphoid, thus assuring a greater area for bony contact and accuracy of relation of the two bones in apposition.

With the forefoot forced into a normal position and held by an assistant securely in proper adduction a hole three-sixteenths to one-fourth inch in diameter is made with the motor drill through the inner extremity of the scaphoid from before backward, obliquely outward and upward into the head of the astragalus and of sufficient depth, one and one-half to two inches, to securely lock the scaphoid to the astragalus. The drill is disengaged from the motor and left in position in the drilled hole. A strip

of cortical bone is next removed from the crest of the tibia sufficiently thick to form the dowel-peg of the same size as the drill used. This can be done with a chisel but preferably with the single or twin motor saw. When shaped in the dowel-shaper it is ready to be substituted for the drill which has been left in position in the hole drilled through the scaphoid into the astragalus. The dowel is introduced into its bed immediately the drill is withdrawn, the foot being held firmly and steadily in its corrected position by an assistant during the withdrawl of the drill and the introduction of the dowel-pin, which is driven home by a few taps of the mallet. The excess length of the pin is cut off with forceps or the motor saw flush with the bone surface.

The skin wounds in the leg and foot are closed with catgut mattress sutures without drainage, dressings are applied, and a plaster of Paris cast put on from the toes to the knee with the foot at a right angle.

Convalescence is uneventful. The patient is up out of bed in a chair with foot and leg in a horizontal position in three or four days. At the end of two weeks he can be up on crutches for intervals during the day if a single foot is operated. At the end of six weeks the cast is removed and massage, active exercise, and weight-bearing is begun. At the end of eight weeks, in the author's experience, full weight bearing can be allowed.

The advantages of the operation are:

1. The period of treatment is greatly shortened.
2. There is no possibility of a relapse to the former condition and position.
3. A strong, painless, stable foot is the result.
4. There is no diminution of the necessary function of the foot.
5. There is entire relief from the torture and annoyance of wearing flat-foot arch supports or other external supporting braces or specially constructed shoes.
6. The operation is applicable to cases much younger than could heretofore be treated by any operative procedure.
7. The technique is simple, definite, and accurate.

Lewis, D.: Transplantation of Tissue. *Lancet-Clin.*, 1916, cxv, 296.

The author believes that the autoplastic graft is the most successful of the skin transplants. He believes that in bone-grafting, the ideal graft is one containing enough compact bone to lend support and fixation when required, and not sufficient to cause cellular death; hence he prefers the anteromedial surface of the tibia for grafting purposes; that the compact bone of a graft is gradually absorbed to be replaced by the periosteum and the endosteum, that bone-grafts placed in cavities, following curettage of giant-cell sarcomata or fibrous osteitis, do not live because of the bleeding into the cavity, thereby preventing vascularization; that bone transplanted into infected areas lives and reacts to the infection like normal bone; and that the inlay graft gives better results than the intramedullary splint in ununited fractures.

He describes in detail the technique of an operation as performed by McArthur upon one of his own patients. In this case the flexor tendons of the forearm were torn, and were repaired by transplanting strips of fascia, which had been previously covered by a layer of subcutaneous fat.

He believes the success of a tendon-transplantation or of a repair of a tendon by fascia depends upon the early function of the part after the operation.

Lewis and Kirk, having by experiments successfully bridged defects in nerves by fascial tubes, now believe this method practical when nerve-tissue cannot be secured as a transplant. J. R. Martin.

Watson, C. G.: Amputations at Base Hospitals in France. *Brit. M. J.*, 1916, i, 479.

The author explains the reasons for and encourages the use of the flapless or flush amputation, the method of Antyllus, as revived and used in the present war. The main points to be kept in view in all amputations are:

1. To keep the patient alive during and after the operation.
2. To perform an operation which will check the spread of the infective gangrene and prevent septicæmia.
3. To save as much limb as possible.

The disadvantages of the flap amputation method are:

1. There will be less chance of ultimately saving the patient's life because there will be less chance of checking infection.
2. There will be more chance of the patient losing his life at the time from shock.
3. For the amputation to succeed it will have to be performed as high as or higher in the limb than the second stage of a primary flush amputation.
4. Healing by first intention cannot be expected. (The cases must be seen to appreciate this.)
5. The risk of secondary hæmorrhage (a very grave danger in these cases) is greatly increased. Since the routine adoption of the flush method the author states that not a single case has been lost from secondary hæmorrhage following amputation in the hospital he is connected with. The only death in their hospital from secondary hæmorrhage after amputation, during the last six months, occurred in a case operated on near the front by the flap method. Secondary hæmorrhage occurred during transit and again after admission to the hospital.
6. The need for reamputation for sepsis or hæmorrhage may be expected at a time when the patient is unable to stand further operation, and often when there is not enough limb available for an amputation.

The advantages of the flush method are:

1. Rapidity with minimum shock.
2. A plain open surface for dressing, which is

favorable to the subsequent control of sepsis and which prevents pocketing.

3. Great diminution in the risk of secondary hæmorrhage.

4. The operation provides the best mechanical relief of gas tension by dividing all the tissues at right angles to the muscle planes.

5. It allows a temporary amputation to be performed close to the site of the injury, so that a permanent amputation can be performed later (when sepsis is under control) a little above the injured area.

6. In cases associated with fracture the proximal end of the bone can be and should be left intact (that is, not sawed through) and projecting beyond the plane of muscle-section, thus minimizing the risks of osteomyelitis and also providing a useful medium (1) for the application of pressure by means of dressing in case of hæmorrhage (a practical point of great value), (2) for moving and fixing the limb, and (3) for the application of extension to the skin.

The flush circular method may be modified, according to circumstances, by a single flap cut from the damaged area and turned back, thus saving a few inches of bone in the final result, although this flap is liable to slough owing to anaerobic or streptococcal infection.

The author lays stress on the after-treatment of the flapless amputation. At the secondary operation it is important not to open up muscle planes because of the danger of "flare-ups." The muscles attached to the bone should be carefully separated from the periosteum by snipping with scissors until the amount of bone required to be removed has been bared. If the bone is divided without lacerating the granulation tissue the operation can be done without any local or general reaction. The periosteum should not be stripped back from the bone, otherwise new bone will be thrown out in the muscles.

During the interval between the first and second operation the skin should be kept stretched by means of an extension. The second operation can and should be performed before any serious cicatricial contraction has occurred. In several instances a completely healed and comfortable stump has been secured within a month of the original amputation.

LLOYD T. BROWN.

Kelly, M. F.: The Flapless Amputation. *Brit. J. Surg.*, 1916, iii, 676.

The author strongly advocates the flapless method of amputation in (1) gaseous gangrene, (2) compound comminuted fracture, and (3) multiple wounds.

The author summarizes the advantages of the method as follows: (1) it saves life; (2) saves length of limb; (3) lessens the risk of secondary hæmorrhage: (4) arrests the spread of infection, whereas in flap amputations sepsis often recurs in the flap and spreads up from there.

The amputation is done as follows: The skin and deep fascia are divided, usually by a circular incision. After retraction has occurred the muscles are divided at the level of the retracted skin — not too quickly to allow retraction of the layers; then the bone is sawed off flush with the muscles; the vessels are secured and nerves properly shortened. Retraction is easily overcome by extension once the face of the wound is clean.

The method enables the amputation to be done close up to the involved area and would seem a rational procedure under conditions which exist at the front.

F. D. DICKSON.

Bryan, C. W. G.: The After-Treatment of Amputation Stumps. *Brit. M. J.*, 1916, i, 480.

The author describes an apparatus for making traction on the skin and soft parts after amputation of either the flap or the flapless variety. It consists of longitudinal strips of two-inch adhesive strapping applied to the amputation stump from the joint above to about an inch from the edges of the wound and then prolonged about twelve inches beyond the edge of the stump. These strips are attached to an aluminum ring eighteen inches in diameter. This ring is attached by three pieces of cord tied to it at equal distances from one another, the cords passing through pulleys hooked to a Balkan splint to which an extra crossbar of wood has been bolted. The free ends of the cord are tied together and the weights are hooked on. For a thigh amputation a weight of about eight pounds is used, while for the arm about five pounds suffices.

LLOYD T. BROWN.

ORTHOPEDICS IN GENERAL

Roberts, P. W.: Paralytic Feet. *N. Y. M. J.*, 1916, ciii, 826.

The operation proposed applies to practically all forms of paralytic feet where there is instability of the ankle. It is neither so radical as complete astragalectomy nor so uncertain as arthrodesis. The mechanical problem presented in cases of instability of the ankle following paralysis is the restriction of anteroposterior motion at the tibio-astragalar joint and lateral motion between the os calcis and astragalus. Control of either of these joints without control of the other will yield imperfect results; therefore it is necessary that both be included in any plan to stabilize the foot. If movement at the ankle-joint is obliterated, there will still be enough anteroposterior motion between the os calcis and the astragalus and between the head of the astragalus and the scaphoid to maintain a considerable degree of elasticity in the foot. Hence the operation under consideration aims to efface the astragalotibial joint and to drop the external malleolus down sufficiently to overlap the os calcis, thus blocking lateral motion between this bone and the astragalus. Through a fishhook incision, such as is commonly used for astragalectomy, the astragalus is exposed and dislocated from the mortise formed by the lower end of the tibia and

fibula. The astragalus is then remodeled by resecting the upper half on a line corresponding to the superior border of the neck, leaving a flat surface. The sides of the bone are trimmed to transform the astragalus into a rectangular block. The mortise of the ankle is then squared out to fit over the block-shaped astragalus. The foot is displaced backward and put up in plaster of Paris. This dressing is removed at the end of two weeks for inspection of the position of the foot, which at that time may be altered, if found necessary, and another plaster is applied. The patient is allowed to walk on the foot four weeks after the operation and at the end of ten weeks the plaster is removed and the foot is ready for use.

The advantages claimed for the operation are: greater stability, less likelihood of relapse, and a much shorter period of after-treatment than is necessary with operations now in use.

Bauman, G. I.: Congenital Club-Foot. *Cleveland M. J.*, 1916, xv, 246.

In discussing the treatment of congenital club-foot Bauman expresses the opinion that no operation, not even a tenotomy or fasciotomy, should be performed until every other method has been tried. The only exceptions to this rule are those neglected or relapsed cases found in older children or adults in which there is a marked rigidity due to bony deformity. Even these cases should receive thorough manipulation before any open operation is performed. Bauman believes that the most perfect results follow those cases in which no open operation has been performed.

ARTHUR J. DAVIDSON.

Painter, C. F.: Hallux Rigidus. *Boston M. & S. J.*, 1916, clxxiv, 708.

The author considers that the chief factor in the etiology of hallux rigidus is the irritation caused by the junction of the vamp and the upper part of the shoe, upon the end of the metatarsal bone of the great toe. To the frequent anatomical variation in the length of the tarsal and metatarsal bones, the author attributes the occurrence of the condition in unilateral cases.

The conservative treatment consists in the wearing of custom-made shoes and the temporary use of a metal plate to limit motion of the affected joint.

Surgical treatment consists in the removal of the ridge on the dorsal surface of the metatarsal or, in very severe cases, the resection of the head of the metatarsal bone. ARTHUR J. DAVIDSON.

Meisenbach, R. O.: Painful Anterior Arch of the Foot; an Operation for Its Relief by Means of Raising the Arch. *Am. J. Orth. Surg.*, 1916, xiv, 206.

The author discusses two types of anterior or transverse arch of the foot which are commonly met with; namely, the flexible and the rigid. The flexible may be associated with a low posterior or longitudinal arch, pronation or weakness of the ankle, and a general atonic condition of the muscles of the leg and foot, the toes usually being straight. The symptoms in this type may be referred to any part of the leg and ankle, but frequently to the anterior portion of the foot in the form of intermittent metatarsalgia. The symptoms generally occur when the foot is in a weight-bearing position.

In the case of the rigid, reversed arch, as Meisenbach calls it, the pain is most marked in the weight-bearing position but frequently continues after the weight is removed from the foot, or when the foot is at rest. The entire metatarsophalangeal girdle is anchored down by ligamentous thickening. The flexor tendons of the second, third, and fourth toes are tense and seem too short to allow the toes to extend. Deep-seated calluses are found under the former arch.

The treatment of the flexible type consists in the use of proper plates, proper shoes, and exercises.

For the rigid type the author recommends osteotomy of the second, third, and fourth metatarsal bones. He then applies a felt pad under the arch and a plaster dressing extending to the knee. The advantages of the operation are:

1. The immediate relief of symptoms with the early dropping off of the calluses.
2. The straightening of the toes, with a high anterior arch and no deformity of the foot.
3. The operation is practically bloodless and the danger of infection practically nil.
4. The metatarsophalangeal joints are not opened and the heads of the metatarsal bones are not resected. PHILIP LEWIN.

Losee, J. R.: Syphilitic Osteochondritis. *Long Island M. J.*, 1916, x, 156.

The author maintains that osteochondritis is one of the most characteristic lesions of congenital syphilis occurring in the early weeks of life. On account of the listless and motionless attitude which the infant assumes, it is clinically known as pseudoparalysis. The lesion is observed at the junction of the diaphysis and the epiphysis of nearly all the long bones. The disease is generally observed before the fourth month of life, but cases have been reported as occurring later. In severe cases when the epiphysis separates spontaneously from the diaphysis, the fracture surface is irregular and rough, while in a normal separation the surface is smooth.

The chief symptom of the disease is the loss of function of one or more of the extremities. The articulations are swollen and painful and epiphyseal separation may take place. Symmetrical joints are often involved and the patient assumes a flaccid attitude.

The prognosis depends upon an early diagnosis and prompt treatment. R. B. COFIELD.

Jones, R.: Positions of Election for Ankylosis Following Gunshot Injuries of Joints. *Brit. M. J.*, 1916, i, 609.

The author discusses the position of election for the various joints as follows:

In the shoulder-joint, the arm should be abducted to about 50°. The elbow should be slightly in front of the coronal plane of the body, so that when it is at right angles and the forearm supinated the palm of the hand is toward the face.

As to the elbow-joint, the majority of men are better off with the fixation at 100°. In cases in which both elbows are involved, one should be fixed at 80° and the other at 100°.

In the forearm, if the movements of pronation and supination are lost the radius should be fixed midway between pronation and supination.

All injuries of the wrist-joint should be treated with the wrist dorsiflexed.

In the hip-joint, ankylosis should be encouraged in a position of very slight abduction, with thigh extended and very slight outward rotation.

The knee should be fixed in an extended position.

In injuries of the ankle, the foot should be kept at a right angle with the leg, so that the sole impinges on the ground in a slightly varus rather than a valgus position.

In answer to the question "What should be done with a flail-joint?" Jones says, "Secure by operation an ankylosis in the most useful position." The only exception is the hip-joint where by means of simple mechanism a very useful limb may be obtained in spite of the joint being flail.

PHILIP LEWIN.

SURGERY OF THE SPINAL COLUMN AND CORD

Hassin, G. B., Johnstone, K. L., and Carr, A. M.: Bullet Lesion of Cauda Equina. *J. Am. M. Ass.*, 1916, lxvi, 1001.

The patient, a man of 28, complained of pain in the left lower extremity. The pain would "jump" from the left buttock to the left popliteal region, whence it would reach the left little toe and spread over the foot and the other toes. It would stop for about five or ten minutes and then begin again. He could not sleep nights, could not find rest in the daytime, and could not do his work (that of a watchman), but he was able to walk.

The pain originated six years previously after he had been shot in the back. One attempt to remove the bullet, four hours after he was shot, was entirely unsuccessful. Following the shooting, the patient immediately became paralyzed in both lower extremities. The paralysis was combined with anæsthesia and loss of sphincter control. A month later cystitis developed, which persisted for two years. He could not move around for two years and had to be "carried all this time in a rocker." The symptoms plainly indicated involvement of some of the motor and sensory roots of the cauda equina that supply the lower limbs with motion and sensation.

A curved incision was made from the first lumbar to the first sacral spinous process. The spinous processes of the second, third, and fourth lumbar vertebræ were exposed and removed. The laminæ of the same vertebræ were removed and the dura exposed. The dura was split and dissected free from adhesions to the cauda. The bullet was found at the level of the third lumbar vertebra, surrounded by two solid scars. It was carefully dislodged with blunt dissectors and removed. The slightest possible injury to the surrounding tissues was carefully avoided.

The operation was followed by numbness in the genitals, buttocks, about the anus, and by retention of urine for about six days. Four weeks after the operation the wound cleaned up and for about seven weeks there still was severe pain in the legs, which, however, was gradually disappearing and the patient was getting firmer on his feet. Two months after the operation the pain disappeared entirely, the gait became practically normal, the calf muscles increased in volume one inch, the pain sensation was found to be normal — but only in the right leg — while in other areas the sensibility showed the same disturbances as before the operation. No change was found in electric findings, in the reflexes, or in the muscle power. The improvement was so marked that the patient insisted on leaving the hospital and felt able to resume work.

EDWARD L. CORNELL.

Kleinberg, S.: Congenital Anterior Curvature of the Spine. *J. Am. M. Ass.*, 1916, lxvi, 736.

The author describes a case of true congenital lordosis of the spine not associated with any other deformity.

The case is described in some detail as to X-ray and laboratory findings. His conclusions are that this was an instance of congenital lordosis in which he believes heredity played no part and despite the marked lordosis there was no albuminuria.

C. C. CHATTERTON.

Armour, D.: Gunshot Wounds of the Spine; Their Surgical Aspect. *Lancet*, Lond., 1916, cxc, 770.

The author divides gunshot wounds of the spine into two classes: (1) those in which there is no interference with the function of the spinal cord; (2) those in which there is more or less interference with the function of the spinal cord with or without obvious injury to the vertebral column.

Injury to the vertebral column may be followed later by effects of inflammatory products: adhesions, narrowing of the spinal canal, intra- or extradural clot, etc.

Immediate injury to the cord may be caused by: (1) the missile passing through part or the whole of the cord; (2) fractured bone causing compression, contusion, laceration, or complete division; (3) concussion.

The author has found the X-ray to have only confirmatory value in localizing bone injury and foreign body position.

The points of importance arising regarding operative intervention are: (1) Will any benefit to the patient result from the operation? (2) Will his life be endangered by the operation? (3) Will he be made worse by operation?

The author then discusses indications for operation and urges interference under proper surgical skill and asepsis in all cases in which complete section has not taken place, providing the patient is in a fair general condition. He says: "It is unfair to the patient and unfair to surgery to wait on and on till hope gives place to despair and then call in a surgeon as a last resort to perform the impossible."

Operation is therefore indicated (1) to relieve pressure from depressed or displaced fragments of bone; (2) to relieve pressure from blood-clot or from extensive hæmorrhage, either extra- or intradural; (3) to relieve pressure and prevent further destruction from œdema by enlarging the constricted bony canal; (4) to remove the danger of pressure from exudate and inflammatory thickening.

H. W. MEYERDING.

Collier, J.: Gunshot Wounds and Injuries of the Spinal Cord. *Lancet*, Lond., 1916, cxc, 711.

Eighteen months' service has given the author an excellent opportunity to study gunshot wounds and injuries to the spinal cord. The nature of lesions caused by high-velocity bullets, shrapnel, fragments of shell casing, and by the concussion of high explosives without any external wound are:

1. Direct lesions—missile through cord.
2. Indirect lesions: (*a*) those due to an in-driving of bone, etc., into the spinal canal; (*b*) impact lesions where the missile strikes against the bony wall of the spinal canal; (*c*) concussion lesions from the shock of high explosives.
3. Secondary lesions: perithecal and intrathecal hæmorrhage, medullary hæmorrhage and thrombosis, meningitis, œdema (may come late and cause increased symptoms).
4. Remote lesions which may be found anywhere in the spinal cord and chiefly near the surface: spots of necrosis, sieve-like rarefaction, punctiform hæmorrhages, œdema, swelling of axons. These result from passage of a missile through the cord or from concussion suddenly raising pressure.

Case histories illustrating the above lesions are cited. Especially interesting are those resulting from concussion and to shell bursting near the patient without external wound yet producing severe local transverse lesions of the cord.

Root lesions are produced by projectiles directly or indirectly, the latter from subperiosteal hæmorrhage, periosteal swelling, or pachymeningeal hæmorrhage.

Intrathecal hæmorrhage is discussed and the difficulty of explaining the physical signs unless this condition is borne in mind is shown by case history.

A case is cited of total necrosis of the distal segment of the spinal cord at autopsy in a case without sign of hæmorrhage or septic process three months after injury which had produced a total transverse lesion at the third dorsal segment.

The author discusses reflex actions, contractures, disturbances of sensibility, and the distinction between root lesions and central lesions and prognostic indications.

H. W. MEYERDING.

Hull, A. J.: Treatment of Gunshot Wounds of the Spine. *Brit. M. J.*, 1916, i, 577.

To be successful, spinal operations must be performed at an early stage before any vital changes have occurred in the cord. By delaying operative interference, cases lose their chance of recovery either by the sepsis spreading or by pressure on the nerve tissue causing these vital changes to take place.

It would appear justifiable to operate upon spinal injuries when the X-ray localization shows a foreign body present in an accessible position, and especially when there is evidence of some remaining conductivity of the cord, as here the removal of pressure may be followed by great improvement. Pain in some spinal lesions is so intense that an operation is justifiable, whatever the lesion of the cord.

Three lines of treatment are indicated: (1) prevention of sepsis, (2) removal of gross pressure upon the spine, and (3) the prevention of complications which threaten life.

R. B. COFIELD.

Sayre, R. H.: The Occurrence of Late Rickets. *Tr. Am. Orth. Ass.*, Washington, 1916, May.

Rickets occurring in adolescents and adults is less uncommon than has been supposed. Its occurrence abroad has been much more frequently noticed than in this country. Apparently rickets in the adolescent is frequently of the recrudescent variety, and in a number of the author's cases the patients have been subjected to various operations for the relief of the deformity earlier in life, but no effort having been made to eliminate the underlying cause of the softening of the bones, the deformities had recurred, or else deformities of an equally disabling character had taken their place requiring further operative intervention.

In one case a girl, 19 years of age, who had had four previous operations before coming under observation, the femora were so soft that the osteo-

tome cut through at the first blow when a supracondyloid operation was done, but six months later after the patient had been fed upon phosphorus and cod-liver oil, the edge of the chisel was broken off while an operation was being performed upon the shaft of the femur to correct a twist there, and a second instrument was used to complete the operation.

In the case of a boy, 16 years of age, marked knock-knee had developed in the space of three months, and reasoning that if the bones were sufficiently soft to create so marked a deformity in so short a time, pressure could correct the position, the legs were put in plaster-of-Paris bandages, which were subsequently sawed through at the point of deformity, and wedged straight, a perfect result being secured without the necessity of breaking the bones. This boy was placed on phosphorus and cod-liver oil, and remained straight. These cases emphasize the necessity of attending to the underlying cause producing the softness of the bones as well as merely correcting the deformity.

Shackleton, W. E.: Some of the Surgical Aspects of Painful Back. *J. Am. M. Ass.*, 1916, lxvi, 1600.

Shackleton describes an anatomic variation of the transverse process of the fifth lumbar vertebra, "the lumbar rib," and he cites three unmistakable cases, two of which when operated upon were entirely relieved. The condition arises in middle adult life after years of hard labor, but may also follow fracture, or some infection. The backache seems to be due to impingement of the process on the ilium, sometimes thus separating the sacro-iliac joint, or to impingement on the nerve itself. The fifth lumbar nerve seems to be the branch most commonly affected, causing most marked motor symptoms in the peroneal nerve. In the two cases reported, the prolonged processes were removed and instant relief occurred. R. G. PACKARD.

SURGERY OF THE NERVOUS SYSTEM

Bucholz, C. H.: Partial Resection of the Motor Nerves in Spastic Paralysis. *Tr. Am. Orth. Ass.*, Washington, 1916, May.

In spastic paralysis the restoration of the function of the paralyzed limbs demands a long continued re-education and exercise treatment. A greatly defective balance and actual contracture may make rational exercise difficult if not impossible, and may require surgical interference.

Until recently operations on the tendons and muscles were practically the only operative procedures in use in these cases, but within the last two years operations on the nervous system directly have been done in various ways. Among these operations may be mentioned the following:

1. Resection of the posterior roots of the spinal cord (Foerster's operation).
2. Operations to cause temporary paralysis by the injection of alcohol into the nerve-trunks (Allison's method).
3. Partial resection of the motor nerves (frequently called Stoffel's operation).

Although the last-mentioned method has at times been used, it was through Stoffel's anatomical studies and clinical work that the method has been so thoroughly developed. Stoffel has shown that in the cross-section of the nerve-trunk the arrangement of the single bundles is practically the same in every person, so that anyone familiar with the anatomy of the cross-section will find without difficulty at a given place that bundle for which he is looking.

Stoffel's operation consists in a partial resection of the motor supply of the spastic muscles, either after the motor branches have left the main trunk, or, within the main trunk itself. The latter method is used only when the former is rendered difficult or impossible by the anatomical conditions.

Stoffel's operation is, in the author's opinion, indicated in all cases of rather localized spasm with markedly defective balance which is not showing any improvement under exercise treatment.

The contra-indications are as follows:

1. The progressive character of the disease causing the spasticity.
2. Permanent contracture in which case the contractures should be eliminated first, and partial resection of the motor supply may be done later after a sufficiently long interval, if a markedly defective balance persists after exercise treatment.
3. Marked prevalence of the paretic element.
4. Mental deficiency or youth of the patient which prevents careful after-treatment by exercise.

Just as for the resection of the posterior roots it has been made an axiom by Foerster himself that developmental and educational exercise treatment is the most important part of the whole treatment, which is only to be made possible or easier by the operation, so too before doing Stoffel's operation one must be sure that an opportunity will be afforded to give the patient a sufficiently long careful after-treatment.

The technique of the operation is briefly described for partial resection of the motor supply of the triceps cruris and the pronator muscles of the forearm. A modification of Stoffel's operation by the author consisting in transplanting some of the motor supply of the triceps into the peroneal nerve, is briefly described.

Hardouin, P.: Two Complete Nerve Sections, Treated by Suture with Functional Restoration in the Domain of the Injured Nerve (Note sur deux observations de section nerveuse complète, traitée par la suture avec recuperation fonctionelle dans le domaine du nerf lésé). *Bull. et mém. Soc. de chir. de Par.*, 1916, xlii, 612.

The two cases reported by the author were selected from a series of 36 cases of complete nerve sections which were operated upon. These were the only cases which the author has been able to follow.

The first case was a resection and suture of the internal popliteal sciatic on the right. The operation was done in January, 1915, four months after the injury, and voluntary motility was effective four months later.

In the second case there was a complete section of the radial nerve which was sutured in February, 1915. Voluntary movements in this case were not noticeable till ten months later.

In the first case the injury had not caused a total anatomic section of the nerve, but the presence of a voluminous neuroma necessitated resection.

In both cases there was complete restoration of the electric functions of the nerves.

W. A. Brennan.

MISCELLANEOUS

CLINICAL ENTITIES — TUMORS, ULCERS, ABSCESSES, ETC.

Lambert, R. A.: Tissue Cultures in the Investigation of Cancer. *J. Cancer Research*, 1916, i, 169.

A review is given of the results which have been obtained with tissue cultures in studies upon cancer and related subjects. The technique is described and emphasis is laid on the fact that the temperature of the culture medium and the tissue does not have to be rigidly controlled while the cultures are being made; moreover, some time can elapse between the taking of the tissue specimen from the body and its immersion in the plasma medium in which it is to grow. There has been very little trouble from bacterial contamination, probably because of the fact that serum has a bactericidal property of itself. The principle in general consists in placing small pieces of tissue, 0.5 to 2 mm. in diameter, in plasma derived from the blood of the same animal, making the whole a hanging drop preparation and sealing it with vaseline.

Sarcoma and connective-tissue cells are wont to wander out singly or in chains, while epithelial cells, normal or neoplastic, tend to spread in sheets or groups. The cancer-cell, especially the sarcoma cell, tends to show a greater motility as compared with the corresponding normal element. Sarcoma cells may often be seen traveling through the medium at a rate equal to that of a polymorphonuclear leucocyte. This fact probably throws light on the mechanism of the invasive growth and spread of cancer in the body. The author calculates that a cancer-cell by means of this locomotion might in four weeks make its way to the axillary fossa. Continued propagation of normal cells, especially those of connective tissue, is as a rule much easier than in cases of tumor-cells. Many carcinomata and sarcomata are very difficult to propagate even in primary cultures, while others quickly die when transferred early into fresh plasma. On the other hand, connective tissue becomes much more active in subcultures. Tumor-cells are much more susceptible to heat; that is, it kills them much more quickly than it does active tissue cells.

The author quotes Lambert and Hanes, who found that rat sarcomata cells will grow quite as well in the plasma of an immune rat as in the plasma of a normal rat without immunity. This observation affords further evidence that cancer immunity is not to be attributed to circulated antibodies of a cytotoxic nature. They are further able to show that an animal of foreign species, particularly a rabbit, may give plasma satisfactory for the growth of tissue elements derived from an alien species. The plasma of an animal that has been immunized to either the tissue or the blood of another is unsuitable as a medium of growth for the cells of the animal which supplies the immunizing substance. In other words, it is distinctly toxic for these cells. The author emphasizes the fact that variations in growth of preparations occur from the factor of the depth of the hanging drop and the density of the fibrin meshwork. These two factors influence the extent to which the active motile cells wander out. The author cites an instance where an extract of human tumor appeared to inhibit rather than to stimulate the growth of normal human cells.

He has been disappointed in stimulating tissue cultures by using Scharlack R and Sudan III. He thinks, however, that in spite of the fact that possibly with the exception of increased temperature there has been little found that will stimulate tissue growth, this is a most important and interesting field of investigation in regard to the cancer problem.

H. G. Sloan.

Calkins, G. N.: The Effects of Cancer Tissue and of Normal Epithelium on the Vitality of Protozoa; Didinium Nasutum. *J. Cancer Research*, 1916, i, 205.

In experimental study, the author used didinium nasutum, which lives on protozoa and will not eat bacteria, so that he was able to control the factor of putrefaction, to a certain extent, in the food given them to live on. The carcinomata he used were

derived from tumors inoculated into mice, at varying intervals, so that when needed they were of the same age and approximately of the same size. The tumor was fed to the didinia in definite, stated amounts in addition to their normal food supply of paranecia. Two series of controls were run. All the didinia were derived from the same stock. The treatment was given in three periods of five days each, from Monday to Friday inclusive. The living indicators of the didinia were observed for varying periods after such treatment and compared with the normal controls, attention being especially paid to their rate of multiplication and their death. Identical experiments were conducted, only that normal epithelium from the mouse's abdomen was substituted for the cancer tissue in feeding. The dosage of food was accurately gauged. All tissue fed was finely minced and given fresh.

The conclusions drawn from the cancer feeding were: (1) cancer tissue contains something which produces a depressant effect on didinium; (2) it also produces something which produces a stimulating effect. In weak doses, the stimulating factor of a cancer tissue is apparently more noticeable than the depressing effect, or lethal. Larger doses than usual were fatal through all the organisms. In feeding normal epithelium the author found there was no depressant lethal factor in it, but that it caused a stimulation of the organisms. The double dose with cancer feeding gave a mortality of 40 per cent, or more than twice that of the control, 15 per cent; while the double dose with epithelium gave a mortality of 6.6 per cent against 10.6 per cent for the control. With four times as much tissue material in the double dose series as in the half dose, the death-rate with normal epithelium was not raised even to that of the normal controls; hence, the lethal factor cannot be due to an exhaustion from the excess of the stimulating factor.

The author then proposes a theory for the origin of cancer; namely, that cancerous changes may originate in cells from the predominance of the stimulating factor. This, he thinks, may be caused by the autolysis of cells which are being constantly destroyed at the seat of any chronic irritation. He quotes Bullock and Rohdenburg, working in his laboratory, who showed that in rats that had the posterior lobes of their pancreas closely ligated and allowed to remain and autolyze *in situ*, the adjacent parts of the pancreas showed greatly increased mytosis. H. G. Sloan.

Bell, E. T., and Henrici, A. T.: Renal Tumors in the Rabbit. *J. Cancer Research*, 1916, i, 157.

Bell and Henrici believe that new-growths of any kind are very rare in rabbits. Although the rabbit is very extensively used for laboratory purposes, reports of only 35 tumors were found. Of the recorded tumors 24 were uterine, and 2 were tumors of the kidney. The authors' two neoplasms occurred in adult male rabbits, both having been found on the same afternoon, and although they state that they have autopsied over 400 rabbits during the last three years, no other tumors have been seen. It was impossible to ascertain the ages of the rabbits or whether or not they were both from the same litter, since animals obtained from different persons had been put into a cage together. In the first case a spherical tumor 1.4 cm. in diameter was found about the center of the outer border of the left kidney. Apparently it was of cortical origin, since it did not involve the medulla. It was sharply marked off from the renal tissue, fairly firm, and whitish gray in color. A thin prolongation of renal capsule covered the tumor. No metastases were found. The second case was very similar to the first, though apparently in a much later stage of development. There were a few small areas that closely resembled the structure of the first tumor, but almost everywhere the cellular masses characteristic of the first tumor had differentiated into solid cords and tubules.

These rabbit tumors thus correspond closely with those neoplasms of the human kidney commonly described as adenosarcomata. The simplest interpretation of their origin is to regard them as having developed from portions of the metanephrogenous tissue which became enclosed in the kidney during its early development but failed to form connections with the collecting tubules. Since no striated muscle was present, they are not comparable, the authors state, to the mixed tumors of the kidney which occur so frequently in children, and which are best explained as derived from portions of the primitive segments. George E. Beilby.

Tyzzer, E. E.: Tumor Immunity. *J. Cancer Research*, 1916, i, 125.

In a consideration of tumor immunity it appeared to the author desirable to discuss resistance to spontaneous tumors and to implanted tumor separately. Although results obtained with experimentally implanted tumors have contributed to the biology of tumors, these results cannot be applied directly to spontaneous tumors, and this is especially true with respect to immunity. It has long been recognized that immunity to implanted tumor gives no assurance against the subsequent development of spontaneous tumors.

The results of the experimental investigation of tumors, as well as of clinical and pathological observation, appear to favor the following conception of the nature of tumors and their relationship to the other tissues.

The interreactions of the normal tissues are mutually beneficial so that their relationship is one of symbiosis.

The anomalies and benign growths, while not distinctly harmful, are usually of no benefit to the individual; the relationship is one of commensalism.

The malignant tumors are in many respects parasitic in nature, especially since they develop at the expense of the other tissues of the body. They are so adapted for growth, once they have become estab-

lished, that they seldom arouse any effective resistance on the part of the body. There is some evidence, however, of a local reaction of tissues unfavorable to the growth of many different types of tumors.

Immunity to transplanted tumor is based on foreignness or incompatibility of tumor and host. This holds true whether the tumor or the animal is taken as the constant factor with which to test the other. Although the degree of foreignness is not sufficient for the production of markedly cytotoxic or cytolytic sera, as when different species are employed, it appears probable that an immune body is formed which, in the presence of the antigen — or living tumor — excites an inflammatory reaction in the tissue around the tumor so that the latter is isolated and eventually destroyed.

Both susceptibility and non-susceptibility, or the ability to acquire immunity, are inherited, not as a single unit factor but apparently as a complex of mendelizing factors. Non-susceptibility and susceptibility are apparently based on factor differences, or, in other words, on unlikeness or foreignness. Non-susceptibility may thus depend with one tumor on a difference with respect to new factors, and with another tumor on a difference with respect to many factors. In the comparison of a stock of Japanese waltzing and several stocks of common mice, the non-susceptibility of the latter to a carcinoma, J. w. A., is based on a difference with respect to a large number — probably twelve to fourteen — of independently inherited factors.

Susceptibility is in this material a dominant character, since it is manifested when its factors are present in a single representation, as in the F-1 hybrid. The presence of a single representation of the factors of non-susceptibility in the F-1 hybrid apparently stimulates the growth of the tumor, for its rate of growth is more rapid than in the Japanese waltzing mouse in which the factors of susceptibility are doubly represented.

There are marked differences in the behavior of various tumors on transplantation in given classes of mice. Even tumors arising in homogeneous races show such differences, and this may be attributed to the acquisition of new characteristics by the soma which are manifested in the development of the tumor. The tumor, since it breeds true with respect to these characteristics in the course of artificial propagation, may be regarded as a modification of the somatic tissue which may be termed somatic mutation. GEORGE E. BEILBY.

Simon, C.: Cure of a Suppurated Chancrous Bubo in Eight Days Without Apparent Cicatrix, by Filiform Drainage (Guerison d'un bubon chancrelleux suppuré en huit jours, sans cicatrices apparentes, par le drainage filiforme). *Bull. et mém. Soc. méd. d. hôp. de Par.*, 1916, xxxii, 318.

Simon reports a case which ten days after recovery from soft chancre showed ulceration of the glans and a left inguinal adenitis. After about twenty days' treatment by puncture, etc., with little effect, filiform (thread) drainage of the bubo was instituted. Immediate improvement was observed and in eight days the skin had a normal appearance.

The author hastens to report this case, in which he thinks the method of filiform drainage transformed a long and wearisome disease into a slight ailment, because he thinks that the procedure is of distinct therapeutic value in the treatment of bubo.

W. A. BRENNAN.

Sequeira, J. H.: Dermatolysis and Molluscum Fibrosum, with Congenital Morbus Cordis and Kyphosis. *Proc. Roy. Soc. Med.*, 1916, ix, *Dermatol. Sect.*, 84.

The case is reported of a man, age 21, who resembled a boy of 15, presenting a remarkable soft pendulous growth on the left side of his forehead, as though the skin of his brow and eyebrow had grown many times more redundant and slipped down over his cheek. Illustrations show the improvement in the patient's appearance after a remarkably successful cosmetic operation. H. G. SLOAN.

Quillian, G. W.: Acidosis in Surgery. *Ann. Surg.*, Phila., 1916, lxiii, 385.

The author having observed that the progress of the gangrene of a diabetic's leg varied with the presence or absence of diacetic acid in the urine, he undertook a consideration of the influence of acidosis in a series of cases. The report is based on a study of 138 consecutive major operative cases. Except in a few emergency cases in which glucose and soda aa℥ss was given as a retention enema a short time before the operation, the following preliminary routine was followed:

Soda bicarbonate ℥ss in one half glass water T. i. d. one-half hour before meals, was given for two days preceding operation.

Soda bicarbonate and glucose aa℥ss with water q. s. ad ℥viii was given as a retention enema, B. i. d. for two days preceding operation. Liquid diet and large quantities of water were given for 48 hours preceding operation, but no buttermilk or egg albumens for 24 hours preceding operation.

Castor oil ℥ss was given the morning preceding the day of operation. Soap suds enemata were used the night preceding, and the morning of, the operation.

Strontium bromide gr. xxx was given the night preceding operation to insure a good night's rest. Morphia, gr. 1/8, with scopolamine, gr. 1/100 was given, one hour preceding gas and ether anæsthetic.

After operation the patients were again given soda bicarbonate ℥ss in one-half glass of water one-half hour after meals for several days. Water and liquid diet were given as soon as nausea ceased and continued until a light diet was given on the fourth day. An eliminant was given on the third day after the operation.

There was no mortality in the entire series and only five cases of appreciable shock. This has led

the author to believe that acidosis has a dominating influence in surgery, and that by careful pre- and post-operative treatment it may be largely eliminated. From this series, he believes, that post-operative nausea is greatly diminished by the preliminary use of soda bicarbonate. GATEWOOD.

SERA, VACCINES, AND FERMENTS

Sellards, A. W., and Minot, G. R.: The Antagonistic Action of Negative Sera upon the Wassermann Reaction. *J. Med. Research*, 1916, xxxiv, 131.

At the time when the Wassermann reaction was first inaugurated it was assumed that its mechanism was completely understood, i. e., that it conformed precisely to the Bordet-Gengou phenomenon of complement fixation. With the demonstration that a specific antigen was not only unnecessary, but that it was inferior to some of the non-specific antigens, it became evident at once that complement fixation as applied to the diagnosis of syphilis cannot be explained on the basis of the phenomenon of Bordet and Gengou. Not only is the reaction non-specific, but it is now well established that the Wassermann reaction may sometimes occur in certain conditions other than syphilis.

Investigation as to whether normal sera are actively negative, in the sense that they would antagonize a positive serum, forms the basis of this paper. These findings are considered in regard to their practical bearing upon the Wassermann reaction and upon the method of complement fixation in general.

A simple method was adopted in order to test the effect of negative sera upon a positive syphilitic serum. A small amount of negative serum was mixed with the minimal amount of positive serum that would cause complete fixation. A Wassermann reaction was done on this mixture in the usual routine way, after it had been incubated for a short time. From their findings the authors draw the following conclusions:

1. Sera which give a negative reaction with the Wassermann test possess definite inhibitory properties toward positive syphilitic sera, except in certain special cases.

2. The extent of this inhibitory action in negative sera varies widely in different diseases but it is usually comparatively weak. It is easily demonstrable even though it is present only in slight degree.

3. Human sera present three distinct phases in their behavior toward the complement fixation of the Wassermann reaction: (1) negative, (2) positive, and (3) inert action.

These results are explained most readily on the basis of a balanced mechanism. The inhibitory action of negative sera cannot be accounted for solely on the basis of its content in natural sheep amboceptor. GEORGE E. BEILBY.

Smith, N. R.: The Serotoxin of Jobling. *J. Lab. & Clin. Med.*, 1916, i, 584.

The production of a serotoxin by treating homologous and heterologous sera with chloroform and ether as reported by Jobling has found wide acceptance among workers in the field of anaphylatoxins and is incorporated in the literature of the subject alongside the earlier pioneer work of Richet, Bordet, Friedberger, Nathan, and others. Jobling maintains that the ferment action of the serum is held in abeyance normally by an unsaturated lipoidal antitryptic substance, the removal of which by lipoid solvents permits autolysis of serum proteins, thereby forming a poison, which is in all probability identical with Vaughan's protein split product. Some work was under way in his laboratory in which splitting of germ substance by sera was the desired end.

In the light of Jobling's work it seemed to the author reasonable to assume that the splitting action of the sera could be greatly increased and accelerated by shaking out the sera with chloroform before incubation with the germ substance. Therefore rabbit serum was shaken with one-tenth its volume of chloroform four minutes, then centrifuged at 8,000 R. P. M. for ten minutes and the supernatant serum carefully pipetted off from a precipitate that, upon centrifugation, was interposed between the chloroform on the bottom and the serum above. As a matter of routine, controls were made by testing the action of the serum on guinea pigs before incubation with the germ substance. As high as 9 ccm. of the normal untreated serum had been injected without effect, but since the M.L.D. of serum and germ substance after incubation was known by trial to be 3 ccm. or less, the control injection of the normal serum was usually limited to 3 ccm. But upon the injection of the chloroformed serum in 3 ccm. quantities as a control, that is, without incubation with germ substance, the pigs died instantly. Reduction of the dose to one cubic centimeter still produced death in most cases, and always a marked prostration.

The character of the deaths, together with the autopsy findings, clearly indicated atypical anaphylaxis and pointed strongly to the residual chloroform in the serum as the toxic agent.

Smith concludes that the intravenous injection of high dilutions of chloroform may cause sudden death in guinea pigs, and that when blood serum has been shaken with chloroform the complete removal of the chloroform is difficult. The toxicity of the serum falls with the completeness of the removal of the chloroform. Death in guinea pigs caused by the intravenous injection of serum which has been shaken with chloroform is often at least, he states, not typical of anaphylactic shock. Serum when shaken without chloroform may cause typical anaphylactic shock with death and typical autopsy findings. GEORGE E. BEILBY.

Hektoen, L.: Vaccine Treatment. *J. Am. M. Ass.* 1916, lxvi, 1591.

The general results so far from the routine use of commercial vaccines, polyvalent and mixed, have no value as evidence for or against curative useful-

ness of vaccine treatment, and hence no value, either, with respect to the soundness of the theory on which vaccine treatment primarily has been developed.

In subacute and chronic localized infections, the results appear to indicate that specific vaccines properly and skillfully used have value, quite likely because they increase the production of specific antibodies, as demanded by the theory, but probably also because they stimulate leucocytic and other activities.

In typhoid fever and possibly also in other infectious diseases, the intravenous injection of specific vaccines and also of other substances may induce crisis and prompt recovery. The mechanism of this action is not fully understood, but as it involves something more than, or different from, specific stimulation of the production of antibodies, it cannot be interpreted in terms of the current conception of the action of vaccines. We are entering, therefore, upon a new and interesting development in the study and treatment of infectious diseases.

EDWARD L. CORNELL.

BLOOD

Della Valle, L.: Suppurative Hæmatoma of the Iliac Fossa (Ematomi suppurati della fossa iliaca). *Riforma med.*, 1916, xxxii, 90.

The author says that while almost every variety of hæmatoma has been the object of very close study and detailed description, deep hæmatomata of the iliac fossa do not get the amount of attention which their importance demands, particularly on account of their complications in suppurations. His article is therefore devoted to a detailed description of the pathologic anatomy, symptoms, diagnosis, and treatment of this condition.

His study is based on clinical data obtained in hospital cases observed and operated upon by him within the past few years.

In the treatment of these suppurative hæmatomata, it must be noted that the pus forms a vast subperitoneal focus which is limited in front by the fascia iliaca and beneath by the crural arcade. To open this, therefore, the incision must be horizontal and above the arcade in a point indicated by the flucuation while avoiding the epigastric artery. The skin, subcutaneous fascia, the aponeurosis of the oblique muscle, the transverse, and the fascia transversalis must be cut through before the pus focus is reached. A hæmatoma of large dimensions may more conveniently be evacuated by a lumbar incision.

W. A. BRENNAN.

Kleiner, I. S.: The Disappearance of Dextrose from the Blood After Intravenous Injection. *J. Exp. Med.*, 1916, xxiii, 507.

The chief purpose of the author's present work was to study the disappearance of sugar from the blood under various conditions. In order to obtain a basis of comparison a series of experiments was first carried out in which dextrose was injected into normal animals. These experiments brought up the question as to whether the passage of sugar from the blood into the tissues was a vital process and led to a series of experiments in which dextrose was injected into dead animals. These experiments yielded the following results:

1. As has been found by other investigators, when a large amount of dectrose is injected intravenously into a normal dog it disappears from the circulating blood in about 90 minutes after the end of the injection. Varying amounts — an average of 60 per cent — are excreted in the urine.

2. Even in nephrectomized animals the same quantity will leave the circulation in the same length of time as in normal animals.

3. This phenomenon seems to be, at least to a great extent, independent of vital processes, since dextrose, after intravenous injection into dead animals, is found to leave the blood rapidly.

4. The phenomenon is independent of the important abdominal organs, for it also occurs in animals (living or dead) in which the aorta and inferior vena cava have been ligated near the diaphragm, thus abolishing most of the circulation posterior to the diaphragm.

5. The fact that a considerable amount of the sugar passes from the circulation into the surrounding tissues was established by finding an increase in the carbohydrates of the muscle tissue. This was done in the case of the living anterior animals and in the whole of anterior dead animals. In most of these experiments there was also evidence of the formation of polysaccharides in the muscle tissue.

GEORGE E. BEILBY.

Willmoth, A. D.: Some of the Uses and Abuses of Normal Saline Solution. *Am. J. Surg.*, 1916, xxx, 147.

The author reviews the history of transfusion with its many difficulties and uncertainties, dating as far back as 1492, when Pope Innocent VIII was given intravenous transfusion of blood, the donors being three boys. This effort was like many subsequently, unsuccessful, and not until the middle of the seventeenth century did transfusion become a recognized surgical procedure. In 1666 Lower wrote the first detailed account of transfusion, followed soon afterward by Denys of France with three successful cases. It being little more than a curious experiment, after several unsuccessful efforts it was abandoned until the nineteenth century.

An attempt was made to overcome unfavorable results by using something that would supply the volume of blood, yet be easier to obtain and safer to administer from a surgical viewpoint, and would subject the patient to no danger of disease existing in the donor. Milk and other albuminous fluids were tried and soon abandoned.

Isolated cases occurred earlier, but Schwartz in 1881 gave the first methodical description of saline

infusion, this being the first reliable information concerning the use of fluid to take the place of blood. Since more has been learned of the various constituents of the blood, other inorganic salts, such as potassium and calcium, were added to the sodium chloride solution, Ringer and Locke's solutions, whose specific gravity should be 1009, being most often used.

The fact that sodium chloride is found in liberal quantities in most of our food possibly accounts for its indiscriminate use in surgery. It is changed by lactic acid into sodium lactate thereby setting free hydrochloric acid. It is commonly believed that the kidney glomeruli have no limitations for excreting water and the chlorides.

The question of the use of salt solution has not been elaborately studied. Its uses are: (1) to replenish the circulation, (2) to refill the blood-vessels, thereby permitting the mechanical acts of the circulation to proceed, (3) in shock with adrenalin 1:10,000 to 1:20,000 to stimulate the heart and blood-vessels, so that the blood accumulated in the large vessels is again placed in circulation, (4) to stimulate the action of the kidney and skin, (5) its use in sepsis.

Salt solution may be used in the following ways; (1) intravenously, especially after amputation and before tying the vessels, (2) intra-arterially, (3) by hypodermoclysis, (4) by proctocylsis, (5) by leaving a quantity in the abdomen after cœliotomy. It should be used at a temperature of 110 to 120° F. This temperature is perfectly safe, since globulin coagulates at 158° F. and serum albumin at 162° F., and experimentally 165° F. has been well borne by the dog. The heat acts as a stimulant to both heart and blood-vessels, a point to be remembered by the obstetrician.

For the relief of shock it should be used in small quantities by the intravenous method at a temperature of 120° F., frequently repeated, rather than in one or more large injections, thereby avoiding overwhelming the heart. The conditions to be met are in striking contrast to those resulting from hæmorrhage, where death results from absolute loss of blood, not enough remaining in the vessels to sustain vital functions even though it could be kept in active circulation and death results from mechanical interference, not enough blood remaining in the vessels to enable the heart and elastic arteries to transmit the force of the heart contractions to distant portions of the body. As a consequence the blood fails to complete the circuit and all centers suffer from anæmia carried to the point of death. Experiments have shown this would not occur, even though one-half or two-thirds of the total volume of blood be lost, provided the circulation be maintained by supplying a fluid in place of blood.

In the preparation and use of saline in any case, much depends upon the strength and composition of the solution, also the technique of its administration. Too little salt causes the corpuscles to swell and lose their hæmoglobin, or completely destroys them; too much causes them to shrink. To insure correctness tablets should be used or stock solution kept that has been prepared by actual weight. This solution should be prepared by sterilizing by fractional methods.

In private homes water from the teakettle is sterile enough for practical purposes; to this add a heaping teaspoonful of salt and four drachms of glucose to the quart, this being accurate enough save for intra-arterial and intravenous use. As much as 500 ccm. can be easily introduced under each mammary gland or into the cellular tissue at a favorable point, such as between the shoulders or over the abdomen. In the intravenous method difficulty is experienced in trying to locate partially collapsed vessels, in using too sharp a needle thereby piercing the opposite wall of the vessel, and by too rapid introduction. Not more than one ounce per minute should be used.

Abuses: Under no circumstances should saline be used in apoplexy, arteriosclerosis, pulmonary œdema, dilated right heart, threatened sudden death, or collapse from chloroform or ether narcosis, the last two requiring more rapid measures. It should not be used in uræmia. No more than fifty grains of salt should be used to each one hundred pounds of body weight. If elimination be insufficiently rapid, some degree of dropsy and œdema must occur, and is usually in the form of œdema of the lungs; especially is this likely to occur in nephritic patients.

C. C. MAPES.

Krida, A.: The Indications for Blood-Transfusion.
Albany M. Ann., 1916, xxxvii, 161.

The author describes some of the functions and properties of the blood. The indications for transfusion, according to their pathologic physiology, are classified as follows:

1. Conditions in which there is a deficiency in the quantity of the circulating fluid.
2. Conditions in which there is a deficiency of the respiratory elements sufficient in degree to impair the integrity of vital organs.
3. Conditions which are accompanied by disorders in the process of coagulation — increased susceptibility to hæmorrhage.
4. Conditions in which the body has been invaded by infection and its products.

He concludes that blood-transfusion is indicated in the following conditions:

1. Massive hæmorrhage.
2. Marked secondary anæmias, either as a palliative measure or as a pre-operative measure.
3. Essential anæmias.
4. Blood dyscrasias, if fresh human serum injections or thrombin is ineffective.
5. Chronic localized infections of demonstrable etiology, not amenable to other treatment. Immunized blood should of course be used in these cases.

No blood-transfusion should be undertaken with-

out first making agglutination or hæmolysis tests of the patient's and donor's blood.

LUCIAN H. LANDRY.

Minot, G. R.: Methods of Testing Donors for Transfusion of Blood. *Boston M. & S. J.*, 1916, clxxiv, 667.

The author reaches the following conclusions after a full discussion of the subject:

A donor for transfusion of blood should not only be healthy, but should belong to the same iso-agglutination group as the recipient.

Simple and quick methods for testing this have been described. What these tests show *in vitro* can be taken as reliable evidence as to what may happen *in vivo*, so far as agglutination and hæmolysis are concerned.

Even when donor and patient belong to the same iso-agglutination group, there may occur, however, after transfusion, reactions of unknown nature, which are probably of not so severe or serious a nature as hæmolysis.

Agglutination often does not occur *in vivo* and if it does, it does not always cause a severe reaction because of the following three factors: (1) interference with agglutination by an excess of non-agglutinable cells; (2) absorption of the agglutinin by the agglutinable cells; (3) the degree of concentration of the agglutinin.

Hæmolysis does not always occur *in vivo*, when donor and recipient belong to different iso-agglutination groups, because only about 20 per cent of sera that are agglutinative are hæmolytic. Hæmolysis, however, never occurs without being preceded by or associated with agglutination.

If hæmolysins are present in the plasma of the donor or recipient, or both, hæmolysis may not occur, or may cause but a slight reaction *in vivo*, because of the following factors and their quantitative relation to each other: (1) concentration of the hæmolysin, concentration of the antihæmolysin, and a certain degree of absorption of the hæmolysin by the hæmolyzable cells. In discussing these factors, it is pointed out that in certain instances the knowledge of the strength of the antihæmolysin might be of value. LUCIAN H. LANDRY.

Singleton, A. O.: A Reliable Method of Blood Transfusion. *South. M. J.*, 1916, ix, 439.

Singleton reports a method of transfusion successfully used in ten cases.

His apparatus consists of a graduated glass container with the bottom drawn out into two cannula-like processes for connection with the veins and with the top connected by a rubber tube with a pair of pressure bottles.

The container is sterilized, dried, and coated with paraffin and connected with the veins of the donor and the recipient respectively, following the usual technique except that the veins are flushed out with citrate solution prior to the insertion of the cannula.

About 50 ccm. of a 1.5 per cent sodium citrate solution is poured into the container, a tourniquet is tightened around the donor's arm, and the clamp is removed from his vein. The pressure bottle is immediately lowered by an assistant, producing a negative pressure in the container, and the blood rushes in. The amount obtained depends upon the rapidity of its flow, the slower the flow the smaller is the amount of blood obtained. Usually about 200 ccm. can be obtained at a time. Having secured this amount in the container the pressure bottle is immediately raised and the blood forced into the recipient's vein, the vein of the donor being pressed between the thumb and finger and the clamp removed from the recipient's vein. About 50 ccm. should be left in the container and the process repeated. It is essential to keep the blood moving.

Although this method is not simple it can be relied upon to transfuse any quantity of blood desired with perfect safety to the patient, and the author finds that it gives a pressure that is more uniform and more easily controlled than that obtained by the use of a syringe.

Of the 10 cases transfused, 3 were for pellagra, 2 for pernicious anæmia, 1 for puerperal sepsis, 1 for pernicious malaria, and 3 for hæmorrhage. The three cases of hæmorrhage showed rapid improvement and were cured; the case of pernicious malaria showed marked improvement; the other cases died. In one of the cases of pernicious anæmia an unrelated person was the donor in a second transfusion. On the second day following this transfusion the patient developed a temperature of 101° which persisted for several days, and he suffered some slight hæmorrhage from the nose.

The author emphasizes the importance of making Wassermann, hæmolytic, and agglutinin tests with the blood of the donor previous to the transfusion, but regards the blood of an immediate relative as perfectly compatible in the greater percentage of cases. J. W. TURNER.

Peterson, E. W.: Results from Blood-Transfusion in the Treatment of Severe Post-hæmorrhagic Anæmia and the Hæmorrhagic Diseases. *J. Am. M. Ass.*, 1916, lxvi, 1291.

Peterson studied the results of blood-transfusion in severe hæmorrhagic anæmia and the hæmorrhagic diseases. His conclusions, based on the literature and a series of nine cases reported in detail, are as follows:

Transfusion of blood, intramuscular injections of whole blood, and intravenous and subcutaneous injections of homologous serum are the most efficient measures and are of value, in the order named, in the treatment of hæmorrhage and the hæmorrhagic diseases.

In severe cases of acute post-hæmorrhagic anæmia, blood-transfusion is the best, and at times the only efficient, means of resuscitating a dying patient. In chronic post-hæmorrhagic anæmia, provided the cause of the bleeding is removed or

remedied, no other measures will compare in efficiency with transfused blood in producing hæmatopoietic stimulation.

In pathologic hæmorrhage, transfusion of blood has on numerous occasions proved effective after the failure of all other measures. It should be resorted to, then, in those cases which do not respond promptly to the simpler methods of treatment. A. EHRENFRIED.

Barnes, F. R.; and Slocum, M. A.: Direct Blood-Transfusion with the Kimpton-Brown Tubes. *Am. J. M. Sc.*, 1916, cli, 727.

Of the 9 cases reported by the authors, 8 suffered from hæmorrhage and were practically moribund when transfused; the other suffered from sepsis. One of the cases of hæmorrhage was complicated by peritonitis and another by a large carcinomatous mass at the head of the pancreas.

The only difficulty experienced in the use of the Kimpton-Brown tubes was in keeping the stoppers in when pressure was applied to force the blood into the recipient's vein. This difficulty was avoided after the first transfusions by pressing the palm of the gloved hand firmly against the top of the tube while it was being emptied, the stoppers being discarded altogether. With this technique the tubes proved entirely satisfactory.

Six of the patients showed immediate and marked improvement in the general condition and as indicated by the increase in the hæmoglobin estimation and in the red-cell count after the transfusion. The patients who died were those suffering from sepsis and one suffering from carcinoma.

The authors were impressed by the value and simplicity of the Kimpton-Brown method of transfusion. They emphasize the value of transfusion in all cases suffering from grave anæmia, particularly that due to hæmorrhage, but consider it futile in cases of sepsis.

They found it best to have the donor and recipient so far apart that neither would in any way disturb the other nor interfere with work upon the other. J. W. TURNER.

BLOOD AND LYMPH VESSELS

Morton, C. A.: An Unusual Form of Gunshot Arteriovenous Aneurism in Which the Sac was Situated on the Side Opposite to the Vein. *Lancet*, Lond., 1916, cxc, 557.

In the ordinary form of arteriovenous aneurism the aneurismal sac lies between the artery and vein and the communication between the artery and vein is through the sac. In the case which is now recorded there was a communication between the artery and vein, due to the passage of a piece of projectile through them, and on the side of the artery opposite to the communication, where the portion of projectile had passed out of the artery, was an aneurismal sac. Where the portion of projectile had penetrated the vein—i.e., in the side of the vein farthest from the artery—was what may be called a venous aneurism; i.e., a cavity in the tissues containing old blood-clot, communicating with the vein. The piece of metal evidently passed through the vein and artery from below upward.

This is a very rare type of arteriovenous aneurism, there being only one similar case in the series of 50 gunshot aneurisms reported in the *British Journal of Surgery* of October, 1915. J. H. SKILES.

Fuller, E. B.: Notes on a Case of Aneurism of the Dorsalis Pedis Artery. *So. African M. Rec.*, 1916, xiv, 135.

A male, aged 50, complained of a painful swelling on the back of his left foot, which had appeared a month previous and gradually increased in size. He denied any history of injury to the foot.

On the back of the left foot, just below the annular ligament in the line of the dorsalis pedis artery, was a pulsating swelling about the size of a small hen's egg. The skin over the swelling was glazed and reddened and there was considerable tenderness and pain. The appearance of the swelling, apart from the evident pulsation, gave the impression of an abscess about to burst. Pressure on the artery above stopped the pulsation in the tumor. The swelling was diagnosed as an aneurism and it was decided to excise it.

The artery was ligated above and below, and the sac, which contained a considerable amount of blood-clot, was excised. The aneurism was a curious mixture of the fusiform and sacular. At the upper part the artery seemed to have gradually dilated into a fusiform channel and then suddenly a sac was formed in its course; doubtless from the more complete rupture or stretching of the coats of the vessel.

The patient made an uninterrupted recovery, the wound healing by first intention. It may be mentioned that the patient's arteries were atheromatous and he had a double aortic murmur.

EDWARD L. CORNELL.

Neuhof, S.: Diagnosis, Symptomatology, and Therapy of Dilatation Aneurisms of the Descending Thoracic Aorta. *Am. J. M. Sc.*, 1916, cli, 715.

The author recognizes dilatation aneurisms of the descending thoracic aorta as a distinct clinical entity presenting characteristic symptoms, and reports a number of illustrative cases.

The most constant sign is an impact area to the left of the sternum at its middle third. By placing the eye on a level with the chest, a distinct heaving area, distinguishable from that of the apex and occupying the lower left sternal intercostal spaces, can often be detected. A sense of impact is also received when the bell of the stethoscope is placed over this area. This impact sensation may be well detected by snugly fitting two or three fingers in the left middle interspaces near the sternum. Occasionally a systolic thrill is palpable. In some

instances it is possible to detect a difference between the time of the apex impact and that in the left middle interspaces near the sternum. This is best done by placing one finger over the apex and another over the left sternal border. These signs are made more evident by having the patient hold his breath.

There is usually a rough systolic murmur over the dilated aortal area; the second sound has a liquid rather than an accentuated tone and is prolonged so as to occupy the entire diastole or is followed by a diastolic murmur of varying intensity. Pain, when present, is substernal, or may be referred to different parts of the chest, neck, jaws, or head, and is most apt to occur after exercise. These signs are usually associated with some evidence of cardiac decompensation which may not, however, be a marked clinical feature.

The impact to the left of the sternum and the characteristic murmurs suggest the condition, but it is absolutely essential to have roentgenograms or a flouroscopic examination to clinch the diagnosis. The condition is a leutic manifestation and in all cases antisyphilitic medication is indicated.

J. W. TURNER.

Bernheim, B. M.: Choice of Operation in the Cure of Aneurisms of the Extremity. *Interst. M. J.*, 1916, xxiii, 326.

As so many surgeons are poorly prepared to successfully cope with aneurisms, Bernheim offers several suggestions to assist in making a proper choice of procedure in aneurisms of the extremity.

The test devised by Moskowicz is recommended. This consists of rendering the leg bloodless by an elastic bandage applied to the upper pole of the aneurism; the blood stream is then shut off in the parent vessel by a pad in Hunter's canal. When aneurism is stilled the elastic bandage is quickly removed and the returning hyperæmic wave carefully noted. Should the blush quickly spread throughout the leg, compensatory circulation is assured and the parent artery may be occluded. Should the leg remain pallid, collateral circulation is absent or slight and occlusion contra-indicated.

Again, normal pulsation of the arteries of the foot show an absence of compensatory circulation while a lack of pulse practically assures sufficient collateral blood supply.

A case in point is given in which an aneurism of known syphilitic origin and of rapid growth was found in the popliteal space. There was pulsation of the arteries in the foot and the Moskowicz test negative. Therefore, after removal of the aneurismic sac the gap was bridged by a venous transplant from the saphenous vein, care being taken to reverse the vein so that the valves faced the foot. Immediate resumption of the blood stream occurred, the arteries of the foot pulsated normally, and the troublesome symptoms of œdema and numbness entirely disappeared within a short time.

P. M. CHASE.

Makins, G.: The Importance of Auscultation in the Diagnosis of the Vascular Injuries Accompanying Gunshot Wounds. *Lancet*, Lond., 1916, cxc, 812.

The author reports his experience in dealing with injuries of the blood-vessels during the war.

He lays stress on the fact that in any case of swelling of the limbs in connection with gunshot wounds, the stethescope affords a ready means of establishing a diagnosis if there is an aneurism present. The point at which the bruit is loudest and highest pitched will show where the lesion is situated. Aneurisms involving either the arteries, or the arteries and veins, show in addition to the local bruit at their site, also a transmitted bruit in the region of the heart.

The author has not met with any instances in which a pure arterial murmur in connection with the wounded vessels of the arm was audible in the heart, but he has noticed it in a carotid aneurism, and has frequently seen it in connection with the femoral vessels. These transmitted bruits show a temporary persistence. The heart at first is markedly affected, enlarged, and with an increased rate; after a few weeks it is able to compensate, at which time the bruit disappears, unless closely associated with the heart. He thinks that the cardiac disturbance is probably to be explained by the sudden alteration in the force required for the maintenance of general circulation under the altered conditions.

H. G. SLOAN.

Elsberg, C. A.: The Surgical Significance and Operative Treatment of Enlarged and Varicose Veins of the Spinal Cord. *Am. J. M. Sc.*, 1916, cli, 642.

Among vascular lesions of the spinal cord, such as amnesia, angioma, etc., enlargement or tortuosity of the superficial veins, although relatively common, have received little attention in the literature. When the posterior spinal veins are compressed by an extramedullary neoplasm, the veins for some distance below (one or both of the two main trunks) appear engorged and sometimes more tortuous than normal. The appearance on exposure of the cord is quite different from the pinkish hyperæmic look of the distended arteries and veins in intradural inflammatory processes.

The operator should recognize the significance of these enlarged and tortuous veins. A local enlargement or varicosity may take place causing local spinal symptoms, relievable by operation. Cases have been reported of varices or "hæmorrhoids of the spinal pia," the symptoms of which are usually those of a transverse lesion.

In several of the author's six cases the enlarged vein accompanied one of the spinal roots to the dural opening. The abnormalities were of various kinds, the enlarged veins usually pressing upon spinal roots. These were in the dorsal region in five; lumbosacral in one. The condition was always unilateral, proving it not to be due to the operation

itself. In one case a tuberculoma of the cord was present. One case examined microscopically showed hyaline degeneration of the vessel walls. The author's technique in operative treatment consists in the removal of as large a part as possible of the enlarged vein by raising and ligating with fine silk in an aneurism needle. As the veins are very fragile great care is necessary.

The results were improvement or relief in all but two cases which had splastic paraplegia of long standing. The author is uncertain as to whether the venous condition is a cause or effect of spinal-cord disease, and thinks the operative result may be due to the decompression by laminectomy.

HORACE BINNEY.

POISONS

Tullidge, E. K.: Tetanus; a Surgical Complication in the Present War. *N. Y. M. J.*, 1916, ciii, 1022.

Tetanus is a very common complication in the present war. There is usually a mixed infection present. The anærobic nature of the organism is especially suited to the ragged and deep character of the majority of the wounds. The filthy condition of the soldiers, especially their contamination with ground which has been fertilized for ages, predisposes them to inoculation with the tetanus bacillus whenever a wound is sustained.

The usually prodromal symptoms are stiffness and pain in the muscles, especially those of the head and neck. These steadily increase in severity until convulsions ensue.

The use of antitoxin is highly recommended as a curative measure. Enormous doses are used by the author, from 10,000 to 160,000 units being given. The local treatment of the wound is important and the liberal use of tincture of iodine seems to be beneficial.

J. H. SKILES.

MacConkey, A. T., and Zilva, S. S.: Iodine in Tetanus. *Brit. M. J.*, 1916, i, 411.

It is a well-established fact that iodine when mixed with tetanus toxin possesses the power of rendering the latter non-toxic. The longer the period of contact between the iodine and the toxin before injection the less toxic the latter becomes. A mixture of equal parts of iodine and tetanus toxin also possesses the power to produce immunity to subsequent injections of the toxin.

These facts suggested the thought that iodine might be of value in curing tetanus, and a series of experiments was carried out with that in view. The conclusions reached are that iodine when injected subcutaneously has no effect upon tetanus toxin which has also been injected subcutaneously in a different place. The course of tetanus can not be favorably influenced by injections of iodine alone, nor does the latter seem to have any effect in enhancing the power of antitetanic serum. Iodine can only be of use when applied to the infected focus, so that it comes into direct contact with the toxin before absorption.

E. K. ARMSTRONG.

Robertson, H. E.: The Prophylactic Use of Tetanus Antitoxin. *Am. J. M. Sc.*, 1916, cli, 668.

Robertson, in reviewing the prophylactic use of tetanus antitoxins, explains its failure in some cases by pointing out the rapid formation and absorption of tetanus toxin, associated with the extreme rapidity with which it is bound to the nerve-cells, when it cannot be neutralized. The absorption of the antitoxin into the blood is relatively slow, allowing time for the more rapidly formed toxin to gain such headway as to produce fatal results.

Another reason for the failure in some cases is the short duration of immunity conferred by the prophylactic dose, usually fifteen to twenty days. When for one reason or another the formation of the toxin is delayed or not absorbed (delayed tetanus), the period of protection has passed and the disease develops. In active surgical interference in wounds of patients that have remained free from the symptoms for many days or weeks, active symptoms of tetanus will suddenly follow a reopening of the wound or an amputation. Consequently when such interference is contemplated, a second injection of antitoxin should be administered.

Other of his conclusions are that the most ideal and perfect protection against tetanus is the protection of active immunity, produced before infection has occurred. This admittedly is not practical, but deserves further consideration and research.

In a large majority of cases the subcutaneous injection of twenty units immediately after the injury will prevent with certainty the occurrence of tetanus. The delay of a few hours in making the injection may mean the loss of life.

Local applications of fluid antitoxin on wounds are efficacious but unnecessarily wasteful and not always practical.

In cases where injections cannot readily be made, especially in war time, the immediate application to the wound of dried antitoxin tampons moistened by clean fluid may be used as a temporary substitute until fluid antitoxin can be injected.

D. L. DESPARD.

Everidge, J.: Mental Symptoms Complicating a Case of Acute Tetanus During Treatment by Carbolic Injections. *Brit. M. J.*, 1916, i, 443.

Eleven days after having received a severe injury to the lower extremities, the patient developed tetanus, which rapidly grew worse. Antitetanic serum was given, together with 1 ccm. of 1:20 carbolic acid solution subcutaneously every four hours. For a week the spasms were so severe that the patient was given large doses of morphine, chloral, and bromides. At the end of this time the spasms became less marked but the mental condition showed a great change, a condition resembling delirium tremens developing. This lasted five days, during which time restraint was necessary. Incontinence of urine and fæces was present also. Chloral and bromides had no effect but paralde-

hyde had a quieting effect. A relapse occurred with more incontinence and it was a month after the development of the tetanus before the patient's mental state once more approximated the normal.

The author wonders what the connection is between the carbolic acid injections and the condition. One ccm. of the 1:20 solution was given every four hours over a period of about 12 days.

E. K. ARMSTRONG.

Dean, H. R., and Mouat, T. B.: Bacteria of Gangrenous Wounds. *J. Roy. Army M. Corps*, 1916, April, 349.

The authors give an interesting account of a prolonged study of the bacteria in gangrenous wounds at the Third Northern General Hospital which has brought out points of great interest to the bacteriologists and surgeons as shown in the following summary:

1. The series comprises 18 cases of gangrenous wounds of which 3 only were fatal. Included in this total are 4 cases of tetanus, 1 of which was fatal, and 4 cases of gas gangrene, 2 of which were fatal. Among the 18 cases bacillus œdematis maligni was found in 15, and bacillus aerogenes capsulatus in 13.

2. Bacillus aerogenes capsulatus and bacillus œdematis maligni are apparently possessed of powerful enzymes. The former is peculiarly able to attack carbohydrates, the latter proteins. Dorset's egg medium is an admirable medium for both microorganisms.

3. The shape, size, staining reactions, and capacity for spore formation of these bacilli are profoundly influenced by the nature of the culture medium.

4. On Dorset's egg-medium the majority of the bacilli are typical in shape, uniform in size, and are gram-positive. On media which contain a carbohydrate, from which the bacilli can form acid, growth is at first rapid and vigorous, but after a few days the bacilli become atypical in appearance, vary greatly in size, and the majority are gram-negative.

5. Bacillus aerogenes capsulatus forms spores on Dorset's egg-medium and inspissated serum, but not on media in which an acid reaction is produced. Bacillus œdematis maligni forms spores less readily in acid media.

6. The presence of bacillus aerogenes capsulatus and bacillus œdematis maligni is not necessarily associated with the development of gas in the tissues.

7. Bacillus œdematis maligni and bacillus aerogenes capsulatus are essentially saprophytes. They have little or no power to multiply in living tissue. In dead tissue they grow rapidly and produce poisonous substances, by which the adjacent living tissue is destroyed and rendered a suitable medium for the further multiplication of these bacilli.

8. The bacillus tetani was not found in films made from the discharge in any one of the six cases in this series in which it was present.

9. The recognition of bacillus tetani by purely microscopical methods is complicated by the fact that slender gram-positive rods bearing an absolutely terminal spore may be occasionally found in pure cultures of bacillus œdematis maligni and bacillus aerogenes capsulatus. Moreover, pure cultures of tetanus bacilli, especially cultures on egg-medium, often contain many atypical forms.

10. If broth is inoculated with material from the wound in a case of tetanus, and incubated under anaerobic conditions, the presence of bacillus tetani can often be satisfactorily demonstrated by animal inoculation. Such a broth culture should be examined at intervals, and two or three weeks may elapse before bacillus tetani can be demonstrated.

11. The presence of bacillus tetani was demonstrated in the discharge from the wounds of two patients who did not develop signs of tetanus. Both had received injections of antitetanus serum.

12. The discovery of bacillus tetani in the wounds of a patient who had not developed tetanus would obviously be an indication for one or more prophylactic injections of antitetanic serum. But the practical utility of such a procedure is limited by the difficulty and delay which attend the bacteriological recognition of this bacillus. Now bacillus tetani belongs to the same group of anaerobic bacteria as bacillus aerogenes capsulatus and bacillus œdematis maligni. All three have probably a common source, and the conditions favorable to their growth within a wound are probably identical. The demonstration of either bacillus œdematis maligni or bacillus aerogenes capsulatus is a relatively simple matter and does not involve much delay. The discovery of either of these bacilli might with advantage be followed by a prophylactic injection of antitetanic serum.

13. A prophylactic injection of antitetanic serum should be given before any considerable operation is performed on a patient with a gangrenous wound.

L. A. LAGARDE.

SURGICAL THERAPEUTICS

Rowlands, R. P.: Time in Surgery. *Brit. M. J.*, 1916, i, 549.

The author makes an appeal for the conservation of time in connection with surgery.

Often a great deal of time is lost in delayed diagnoses or operation is deferred beyond the safety point. A "wait and see" policy often changes the course of the convalescence. Two cases of appendicitis are reported to illustrate this point.

Avoidance of waste of time at operations is extremely important. This can be accomplished (1) by making all possible preparations and calculations beforehand, in the way of preparation of the patient, instruments, threading sutures upon needles, etc., before the anæsthetic is begun; (2) by improving and simplifying the technique of the operation in every possible way; (3) by concentrating the full attention upon the operation.

J. H. SKILES.

SURGICAL ANATOMY

Horrax, G.: Studies on the Pineal Gland. *Arch. Int. Med.*, 1916, xvii, 607.

Attention is directed to the fact that the clinical aspects of pineal tumors have been abundantly discussed since 1909, when Frankl-Hochwart suggested the possibility of a pathognomonic syndrome. Marburg especially has developed the subject, emphasizing the association of adiposity, which he regards as an indication of overfunctioning of the gland. The salient factors have been gleaned from reports of about 70 cases of tumors of the gland. Of this number only 22 occurred before the age of puberty and these, therefore, represent the source of evidence of that special train of symptoms, which have come to be associated with pineal disorders, namely, premature development in the realm of both primary and secondary sexual characters. In several of these cases, moreover, principally in the earlier reported ones, the case records are insufficient or wanting, and in five others no reference is made to the sex organs, although certain metabolic symptoms are noted. Of these, adiposity, drowsiness, and polyuria are the most frequent, suggesting at once an implication of the pituitary, but the imperfect records preclude any possibility of settling this question at present. Regarding the other cases, of which there are about 10, all but one occurred in young boys between the ages of 2 and 12 years. The exception is Marburg's case, a girl 9 years old.

The author reports three cases from the surgical service of the Peter Bent Brigham Hospital, all of which showed precocious adolescence and overgrowth. A study of the diseases to which the pineal body is subject has been confined almost exclusively to the different varieties of tumors which have been found to arise either from the gland itself or from those structures which lie in its immediate neighborhood and therefore involve the pineal secondarily. Very rarely conditions other than tumor have been mentioned in connection with pineal pathology, but these play an inconspicuous and perhaps dubious part in this chapter of the study of the gland.

From the author's study he gathered the impression that from what is known of the physiology of the normal gland, as well as from the results of Foa's and his own experimental observations, that sexual ripening occurs when the pineal ceases to be functionally active, or when it is removed, and on this basis he inclines to the belief that the tumor in most of these clinical cases is associated with an inhibition of the normal products of pineal secretion. If this were really the case, however, one would suppose that glandular feeding would postpone adolescence, but from the observations of Dana and McCord the reverse seems to occur. The author's own studies in this direction with the feeding of young guinea pigs and rats were not conclusive, and it is a matter which deserves further study. Briefly the author gives the following summary of his work.

1. Extirpation of the pineal in young chickens and lower animals tends to hasten normal maturity.
2. Tumors of the pineal gland in children, occurring before the age of puberty, usually give rise to a syndrome characterized by precocious adolescence.
3. Feeding the gland substance to young animals is said to have the same effect as extirpation, but the observations are somewhat inconclusive.

A report of three cases of supposed pineal tumor, one of which was confirmed by necropsy, is offered as a further contribution to the study of this gland.

GEORGE E. BEILBY.

Vecchi, A.: Critical Observations and Experimental Researches on the Regeneration and Neoformation of Lymph-Glands (Osservazioni critiche e ricerche sperimentali su la rigenerazione e la neoformazione delle linfoghiandole). *Clin. chir.*, Milano, 1916, No. 1, 90.

The author's experiments were carried out on dogs and rabbits. The basis for the subsequent conclusions were dependent upon the following problems: Could a totally enucleated lymph-gland regenerate? Could a partially resected lymph-gland regenerate? Could there exist, independent of any damaging operation, a neoformation of lymph-glands, and could their number be increased in a given region? The conclusions are as follows:

1. After the enucleation of a lymph-gland there is no regeneration, but the formation of a new lymph-gland of substitution.
2. After the partial resection of a lymph-gland, a cure is obtained with the formation of cicatricial tissue, without regeneration of the part excised.
3. In particularly morbid conditions it is possible to obtain a neoformation of lymph-glands, which increases the number of lymph-glands of a given region, either by a proliferation of the pre-existing gland, or by the transformation of the adipose tissue (according to Bayer), or by the development of embryonal germs.

RAOUL L. VIORAN.

Hoskins, R. G.: The Present Status of the Adrenal Problem. *J. Lab. & Clin. Med.*, 1916, i, 512.

The author reviews the literature during the past ten years and summarizes the work that has been done on this subject. He comes to the conclusion that the fundamental question remains yet to be answered, Why does the removal of the adrenal glands cause death? He believes that the trend of the evidence now available suggests that muscular metabolism is at fault. If that be true the solution like that of many another of the most puzzling medical problems, rests in the hands of the biological chemists.

GEORGE E. BEILBY.

Stewart, G. N., Rogoff, J. M., and Gibson, F. S.: The Liberation of Epinephrin from the Adrenal Glands by Stimulation of the Splanchnic Nerves and by Massage, Studied by Means of the Denervated Eye Reaction. *J. Pharmacol. & Exp. Therap.*, 1916, viii, 205.

The observations of a number of investigators have indicated that during electrical stimulation of

the splanchnic nerves, epinephrin passes into the circulation by the adrenal veins. These observations may be divided into two groups: (1) those in which blood has been collected from the adrenal veins of one animal, and tested for epinephrin by its action on the blood-pressure when injected into the veins of another animal; (2) observations in which the liberation of epinephrin has been deduced from changes in the blood-pressure or other reactions in one and the same animal.

It is shown in the present study (on cats and dogs) that the response of the denervated eye to stimulation of the peripheral end of the splanchnic nerves, is due solely to the passage of a substance in the blood stream from the adrenals to the eyeball. For —

1. When the venous path is blocked the response fails, but appears on releasing the block, and at the same interval of time as when the vessels are free. The active substance must therefore have accumulated during the period of stimulation of the nerves behind the block.

2. When the heart is stopped by stimulation of the peripheral end of the vagus, stimulation of the splanchnics produces no effect on the eye. But on allowing the heart to beat again, the eye response occurs at approximately the same time from the moment of re-establishment of the circulation, as the time interval between stimulation of the splanchnics and the response with the circulation is going on normally. During the stoppage of the circulation, by complete cardiac inhibition, accordingly, stimulation of the splanchnics must have caused liberation of the active substance at the same point from which it starts when the splanchnics are stimulated without cardiac inhibition.

3. When the circulation is slowed without being stopped, as by producing partial inhibition of the heart through the vagus or by hæmorrhage, the interval between the beginning of stimulation of the splanchnics and the appearance of the eye response is correspondingly increased.

4. It is possible to find a strength and duration of stimulation of the splanchnics with which no eye response will be obtained, when the ipsilateral or both carotids are clamped, but which will give a response with the vessels free. With longer or stronger stimulation, a response, but a belated one, may occur even with the carotids clamped. The abolition of the response, and its retardation, can be imitated when appropriate doses of adrenalin are injected into the femoral vein with the carotids clamped or free.

5. When adrenalin is injected into the left renal vein, or into the central end of the femoral vein, in suitable amount to produce an eye response approximately equal to that produced by a given stimulation of the splanchnics, the interval of time after which the response follows is sensibly the same for adrenalin injection as for splanchnic stimulation.

6. When the aorta is clamped, and the splanchnic then stimulated, a response may be obtained in the eye while the clamp is still on, or only after its removal, or both during the application and after removal of the clamp. There is some variability in this regard in different experiments. There is also a somewhat greater variability in the time interval at which the response appears than in observations in which the splanchnics are stimulated with the vessels free, or with the veins clamped. The interpretation of these differences is discussed.

7. Circulation time measurements show that there is always more than sufficient time for a substance to have been carried in the blood from the adrenals to the eye before the appearance of the eye reactions.

8. The latent period of liberation of epinephrin from the adrenals on stimulation of the splanchnics is short, since the time interval after which the eye response occurs is sensibly the same whether it is evoked by splanchnic stimulation or by the injection at the level of the adrenals of a quantity of adrenalin sufficient to elicit a response similar in character and amount.

9. The minimum period of stimulation of the splanchnics needed to liberate sufficient epinephrin to elicit a response in the denervated eye is very brief (a fraction of a second). With a current of given intensity the amount of the response increases up to a certain point with the duration of the stimulation.

10. Massage of one or both adrenals causes definite eye response in an animal in which stimulation of the splanchnics has been causing it, and at the same interval of time. When, after repeated excitations of a splanchnic nerve, the reaction of the eye ceases to be obtained, it can still in general be elicited by massage of the corresponding adrenal. But this reaction is soon exhausted.

11. Good eye reactions have been obtained by stimulation of the splanchnics in cats, in which attempts were made before the experiment to exhaust the epinephrin store of the adrenals, for example, by frightening or by administration of morphine. It did not seem that it was easier to exhaust the capacity of the splanchnic nerves for eliciting these reactions in such animals than in animals which were guarded as much as possible against preliminary exhaustion of the epinephrin store by psychical disturbances.

GEORGE E. BEILBY.

Brown, E. D.: Observations on the Effect of Epinephrin on the Medullary Centers. *J. Pharmacol. & Exp. Therap.*, 1916, viii, 195.

Brown calls attention to the fact that the slowing of the heart-beat commonly observed when epinephrin is introduced into the circulation is almost universally held to be due to an excitation of the vagus center, which is induced by the rise in blood-pressure, and therefore is an indirect effect. The question as to whether epinephrin has any direct action upon this center is still unsettled, and there is but little experimental evidence reported in the

literature which would suggest that the drug might produce a direct stimulation.

The present investigation was undertaken with the hope that some additional facts might be discovered which would aid in solving the problem. The experiments here reported were performed on 22 dogs, and a tabulation of the results obtained on 14 dogs where epinephrin had been introduced showed that in 9 of these there was a slowing of the heart, while in 5 it was absent.

The results obtained from the experiments tend to show that when epinephrin is perfused through the cerebral circulation, it may in a certain per cent of cases cause a slowing of the heart and that this slowing is at least in part due to a direct stimulation of the vagus center. There is certain evidence which strongly suggests the probability that the drug also stimulates the vasomotor center. The effect on the respiratory center is very variable. There is evidence of both stimulation and depression, and neither of these effects appears to be governed by the size of the dose of the drug. GEORGE E. BEILBY.

Diena, G.: The Behavior of Some Pancreatic Ferments in the Blood After the Ligature of the Pancreatic Ducts (Sul comportamento di alcuni fermenti pancreatici nel sangue dopo la legatura dei dotti pancreatici). *Internat. Beitr. z. path. u. ther. d. Ernaehrungss.*, 1915, v, 405.

According to the researches of Wohlgemuth if the pancreatic ducts of a dog are ligated, after a few hours there is noted a strong increase of diastase in the urine and in the blood. This reaches a maximum within twenty-four hours after the operation; it remains for some days at this maximum and at the end of eight or ten days goes back to its original figure.

The author's research was carried on in an endeavor to find if in addition to diastase other pancreatic ferments, particularly lipase and esterase, increased in the blood after ligation of the pancreatic ducts. His results confirmed Wohlgemuth's.

Regarding lipase he was unable to find it immediately after ligation of the ducts, but he constantly found it at the end of forty-eight hours, up to the sixth day after operation, with a maximum on the second day.

Esterase exists in the blood serum before operation and increases notably following it.

W. A. BRENNAN.

Robertson, T. B.: The Effects of Tethelin; Acceleration in the Recovery of Weight Lost During Inanition and in the Healing of Wounds. *J. Am. M. Ass.*, 1916, lxvi, 1009.

The author gives a brief outline of the method of isolating the growth-controlling principle, which he terms tethelin, from the anterior lobe of the pituitary body, its chemical properties, and physiologic actions. The dried tissue of the anterior lobes of ox pituitaries is extracted with boiling absolute alcohol, and the solution is evaporated under reduced pressure until solid material begins to separate out on cooling. To this solution is added one and one-half times its volume of dry ether. The substance is thus precipitated and after washing in large volumes of alcohol-ether mixture in the above-mentioned proportions, it is then ready to be dried and pulverized.

Tethelin is soluble in water, also in alcohol, ether, chloroform, and carbon tetrachloride, and is insoluble in a mixture of absolute alcohol and dry ether. It contains 1.4 per cent of phosphorus and nitrogen. It is markedly hygroscopic, and on standing after pulverization in contact with moist air it darkens perceptibly in color and its iodine absorption value decreases, which decomposition is accelerated by warming, but if packed in evacuated glass tubes and kept perfectly dry it may be heated to a high degree without any perceptible discoloration.

The average yield from each anterior lobe may be estimated to be about 10 mg. of tethelin. The action of this substance in doses of 4 mg. per diem, administered by mouth to mice between 4 and 60 weeks of age, consists in a marked retardation of the early (preadolescent) growth in weight, and an equally marked acceleration of postadolescent growth. Mice which have received tethelin are much more firmly and compactly built than normal animals of the same age, and it also has a favorable effect on the nutrition of the skin of the animals.

Since tethelin appeared to be a strong stimulator of growth it seemed probable to the author that it might also accelerate that species of internal growth which consists in the replacement of tissue lost through excessive tissue waste consequent on any circumstance leading to an increase in nitrogen output or a curtailment of nitrogen input, and he accordingly made a series of investigations on 10 male and 10 female mice about seven months of age. The animals were deprived of food for twenty-four hours, at the end of which time 5 males and 5 females were given tethelin and all the animals were allowed free access to food. At the end of 72 hours comparison between the animals which received tethelin and the controls showed that the administration of tethelin led to a very remarkable acceleration of the regain in weight following the admission of food.

The author also made experiments to note the effect of tethelin upon another form of tissue repair, the healing of wounds, and while, as he states, experiments on animals and especially on mice do not afford the most satisfactory means of investigating this process, his results were so favorable as to justify his opinion that tethelin when administered hypodermatically to mice exerts a remarkably stimulating action on tissue repair as expressed in the healing of granulating wounds. GEORGE E. BEILBY.

RADIOLOGY

Kuegle, F. H.: Radio-Activity as a Therapeutic Agency. *Med. Herald*, 1916, xxxv, 172.

After reviewing briefly the events which led to the discovery of the roentgen ray and such radio-

active elements as uranium and radium, the author describes their applicability as therapeutic agents. Regarding their relative values, he states that they are practically identical in their action, differing only in the quality and quantity of the rays produced. The choice of one or the other depends upon the anatomical location of the diseased tissue and the peculiar requirements of the case to be treated. He lays stress on the matter of proper dosage and technique, if beneficial results are to be obtained.

Among the conditions mentioned in which radioactive treatment was found to be particularly useful, were enlarged lymphatic, tuberculous, and lymphocytomatous glands, dysmenorrhœa, uterine hæmorrhage, and fibroids at or near the menopause yielded uniformly good results. Chronic joint diseases and even some selected cases of tuberculous joints showed a fair percentage of cures or improvement. In the latter cases the author believes that the simultaneous use of Bier's hyperæmia treatment enhances the effect of the irradiation. In exophthalmic goiter the results were so favorable that he believes with Sielmann and Schwartz that it is to be preferred to surgery where simple medical treatment has failed.

Regarding the use of radio-activity in cancer, the author quotes a summary from an article by Russell to the effect that its use in no wise should supplant operation unless it be in the removal of certain superficial growths, but that it be used rather as an adjunct to surgery. ADOLFH HARTUNG.

Perkins, C. W.: The Normal Stomach; Its Size, Position, Form, Tone, Peristalsis, and Mobility from a Radiographic Standpoint. *Med. Press & Circ.*, 1916, ci, 258.

After an examination of 58 normal stomachs radiographed in the vertical position and filled with an opaque meal of buttermilk and bismuth subcarbonate, Perkins draws the following conclusions:

1. Peristalsis does not seem to exert any influence on the tone of the stomach, for we may have exaggerated peristalsis with a hypotonic stomach and diminished peristalsis in a hypertonic stomach.

2. There are no determined fixed points of any type of stomach in the abdominal cavity except the cardiac portion. A stomach may be of any of the types and yet be normal from an X-ray standpoint.

3. The average normal stomach is orthotonic. The usual position of the orthotonic stomach is as follows: greater curvature (lowest point) one to two inches above the interspinous line, either median or to the left; lesser curvature (lowest point) three to four inches above the same line, median or one to two inches to the right. The pylorus is placed two or three inches above the line, in the median position, or one and a half inch to the right. The axis of the stomach is vertical and parallel to the median line. The length is eight to ten inches and the width three to three and a half inches.

4. The tendency of the male stomach is always toward hypertonicity, while that of the female is toward hypotonicity. The stomach is not, as a rule, as high in the abdominal cavity as many textbooks of anatomy teach. There is no structure in the human body, however, that has such variations in form, tone, and position.

5. Radiographic examination, either by the fluorescent screen or plate, is the only accurate method of ascertaining the anatomical position, form, peristalsis, and mobility of the stomach. Therefore, bearing in mind that this type of stomach fits the patient, a chart of the relative positions of the stomach should be of service to the clinical diagnostician in locating pathological lesions of that organ; that is, if he has not X-ray apparatus at hand. Such a chart should also be of service to the radiological technician in locating points for radiographic work.

E. H. SKINNER

Hernaman-Johnson, F.: The Uses and Limitations of Stereoscopic Radiography in the Diagnosis of Injury to Bone; the After-Treatment of Fractures as Carried Out in the Electrical Department of the Cambridge Hospital, Aldershot. *Practitioner*, Lond., 1916, xcvi, 249.

The method has a well-defined place in radiographic work. It can neither be dispensed with nor employed to the exclusion of other well-known procedures, as, for instance, in localizing other foreign bodies. It is essential in the diagnosis of injuries to the shoulder, spine, pelvis, and hip. In these regions plates in one plane may be misleading, and the solid effect produced by the stereoscopic view is the only means of checking the ofttimes misleading appearance seen in an ordinary plate. By reversing the plates in the stereoscope, an appearance is produced as if one were looking at the other side of the bones under examination. A bone or joint is never explored radiographically until four sets of stereograms have been taken, anteroposterior, postero-anterior, right lateral, and left lateral. By means of such plates a general view of the relations of the various bones can be obtained, yet one must remember that the exact relationship of distances will be distorted. It is usually possible to say whether a bullet is at one side or the other of the bone or buried within it, and to determine the relative position of fragments; but the stereoscope must not be regarded as an instrument of precision for localization purposes.

The author finds that the use of electricity in the after-treatment of fractures is a distinct advantage where massage and passive motion have not restored the member to normal use. He advises a combination of galvanism with a mild faradism in the form of baths. With a continuous current of 20 to 30 milliamperes used for 20 minutes daily, the faradic current must not be of sufficient strength to cause any distinct muscular contraction. Massage and muscular exercises must be used in conjunction with the electrical treatment if the best results are to be obtained. Fractures in the neighborhood of the elbow, wrist, and ankle will give a normal result

under this method within a month to six weeks. Where weakness is complained of in the limb consequent to fracture, the author advocates rhythmical electrical stimulation by the faradic current, preferably by a Lewis-Jones electrical apparatus arranged to give at least 20 impulses a second. Such a condition of weakness may occur after prolonged immobilization in which all the muscles in the vicinity are affected, or where through faulty position a particular muscle group has been overstretched. In the latter case, a relaxation splint is essential for cure. In general up to a certain point the paretic phenomena are no doubt largely physical, but there is from the first a certain mental element present, a kind of failure of memory as to how the lost movements are to be provoked, in other words, a lack of action patterns in the memory of the movement of the affected part. Stimulation of the individual muscles electrically, therefore, has its greatest usefulness under such conditions. There is a type of pain complained of, following fractures, where the appearance of the limb has become quite normal again and the movements good. The patients describe it as being like toothache. It is made worse by exercise and often keeps the patient awake at night. The application of the high-frequency current by the vacuum electrode, at first on the skin and later at sparking distance, gives relief in a few days. In case pain is not relieved, a careful X-ray examination, with a view to the possible detection of some definite cause, as the presence of a small abscess cavity in the middle of the new formed bone, should be undertaken. X-rays are often of value in relieving pain and causing the disappearance of previous fibrous accumulation. HARRY G. SLOAN.

Turner, D.: Report on the Radium Treatment at the Royal Infirmary, Edinburgh, During the Year 1915. *Edinb. M. J.*, 1916, xvi, 204.

Some interesting points have been presented in this detailed report of 64 cases treated during the past year, 24 of which were malignant and inoperable of this class; 8 being sarcomata in which better results are to be expected if they are favorably situated. He also found carcinomata of the vagina and cervix would usually yield, if localized, but recurrence after a variable length of time was the rule. However, during the interval the patient enjoyed relief from pain, gained in weight, and was in fair health. A preliminary curettage is often of great service. Screening has been found unnecessary in these cases, except to protect the healthy tissues; the dosage should be at least 3,000 milligram hours. In rodent ulcers the results are invariably good, and if they recur it is usually due to insufficient primary treatment. The cosmetic result leaves nothing to be desired. For this reason Turner has employed it in the treatment of papillomata, nævi, and recent cheloids. Nine cases of exophthalmic goiter were treated, two of them being males. While there was very little change in the gland, in fact in one instance it became larger, yet the treatment had some influence upon the general system, for the symptoms were controlled and the health was greatly improved. In these cases a 1.4-mm. silver screen was used, 20 mg. of radium bromide being placed 2 cm. from the skin and left in place for twelve hours. Under these conditions no damage was observed to the overlying integument. This treatment was repeated in 2 or 3 months.

The author believes that while the field of utility for the use of radium is limited, its value in certain well-defined directions has been firmly established.

W. S. NEWCOMET.

Beck, E. G.: An Accurate Method of Localization of Foreign Bodies in the Chest, and Their Removal. *Interst. M. J.*, 1916, xxiii, 259.

The author discusses the value of stereoscopic radiograms in locating foreign bodies, particular stress being laid on the fallacy of attempting to determine from a single radiogram the exact location of foreign bodies, as well as the fallacy of attempting to form a correct view of the position of fragments after a fracture. To illustrate this point the author placed a bullet on the center of the sternum. Two radiograms were taken without changing the patient's position, but the X-ray tube was shifted to a different angle. On each picture the bullet appeared to be in a different location. The cases cited by the author attest the value of the method. In one instance a would-be suicide shot herself with a 42-caliber pistol. The bullet from a single radiogram seemed to be in the axilla. The stereoscopic readings showed the bullet to be against the scapula. It was found there. Beck uses the method in intestinal work, in studying diseases of the accessory sinuses, in estimating the depth of empyema cavities, and in fractures.

ISIDORE COHN.

Millwee, R. H.: Five Hundred Gastro-intestinal Examinations by Roentgen Ray. *Texas M. News*, 1916, xxv, 415.

Millwee reports upon 500 consecutive gastro-intestinal examinations by the roentgen ray with a barium sulphate meal suspended in artificial buttermilk. The roentgen diagnoses in these 500 cases were as follows:

Duodenal ulcer	111
Ptosis, atony, and stasis	143
Appendix involvement	104
Gastric ulcer	48
Gall-bladder involvement	30
Gastric cancer	28
Miscellaneous	19
Negative findings	29

The author was able to follow up 80 per cent of these cases with the following checking: Of the cases operated upon for duodenal ulcer a lesion was found in the duodenum in all but one case;

this case had gall-stone with adhesions. Of the cases treated for duodenal ulcer all responded to treatment except 11.

Fifty per cent of the positive appendix cases were operated upon, all of which showed involvement. In the cases of gastric ulcer and gastric cancer all of the cases operated upon revealed either an ulcer or a cancer with the exception of one case in each group, which showed gall-bladder disease with adhesions. E. H. SKINNER.

MILITARY SURGERY

Mullally, G. T.: A Case of Tetanus-like Spasm Localized to the Wounded Limb. *Lancet*, Lond., 1916, cxc, 867.

Mullally describes a case of shell-wound of the lower end of the femur which necessitated amputation. The case was complicated by gas infection which necessitated extensive opening up of the thigh. A few days after the injury, twitching in the stump began and grew progressively worse, the spasm becoming so painful that chloroform had to be given to control the pain. The author thought that he was dealing with an ascending neuritis in the stump and resected the anterocrural and sciatic nerves without relief. The patient died on the tenth day, at which time the facial expression was suggestive of risus sardonicus. A prophylactic of 1,500 units of antitetanus serum had been given the day of the injury. The author feels that the case was one of tetanus, although there were no general spasms. F. D. DICKSON.

Weinberg, M.: Gas Gangrene in the Present War. *Glasgow M. J.*, 1916, lxxxv, 241.

Gas gangrene has been especially prevalent in the present war. The bacteriology of gas gangrene has been carefully worked out. The bacillus aerogenes capsulatus, otherwise known as bacillus perfrigens, is found in nearly all cases. Only in exceptional cases, however, is it found alone, other organisms being usually associated. These other organisms may be diplococci, streptococci, bacillus proteus, and bacillus sporogens. Another combination of organisms occurs in which the bacillus of malignant œdema (vibrion septique) is the predominating organism. Other organisms are usually associated with the vibrion septique, which is a relatively rare agent in gas gangrene, being found in only 4 out of 100 cases.

In the toxic form, the bacillus œdematis is found associated with the bacillus perfrigens and vibrion septique in the classic form of gas gangrene. From the foregoing it is readily seen that most of the organisms related to the production of gas gangrene belong to the intestinal flora.

Gas gangrene was produced experimentally in guinea pigs by using any of the above-mentioned organisms. In the production of gas gangrene it is necessary to inject a relatively large number of microbes. There must be some contributory cause to account for the small number of bacteria necessary to produce gas gangrene in wounded soldiers. The dissection of limbs amputated for gas gangrene has demonstrated that the gangrene is not due to the presence of organisms but is secondary to an obliteration of the main vessel or vessels. The organisms of gas gangrene find this a very favorable soil for growth. Another factor which is of prime importance in the production of gas gangrene is injury to tissues, especially to muscle. Experimentally it is very easy to show that hæmorrhage and artificial injury of muscle favor the infection in question.

The treatment of gas gangrene in the early stage is the treatment of wounds which are probably infected. The wound should be thoroughly cleansed, all foreign material removed, and the wound kept as wide open as possible. Continual or frequent irrigation with normal saline solution, hypertonic salt solution, or various antiseptics is recommended.

The polyvalent serum of Leclainche and Vallée seems to have given particularly good results in wounds infected specially by streptococci. In the opinion of the author the best autovaccine is one prepared with all the organisms, aerobic and anaerobic, that are found in the wound to be treated.

Early amputation is often necessary, and where not considered necessary many surgeons apply the actual cautery over the whole extent of the invaded area. Free incisions are a matter of routine treatment. Unfortunately, many cases result fatally in spite of the best that can be done. J. H. SKILES.

Lansdown, R. G. P.: Removal of Bullets and Other Metallic Foreign Bodies. *Bristol Med.-Chir. J.*, 1915, xxxiii, 157.

There are four points which should be emphasized in the localization of bullets by X-ray: (1) Every case should be carefully screened by a skilled skiagrapher accustomed to the work of localization. (2) In determining the direction of the "central ray" the smallest diaphragm must be used. (3) It is essential in all difficult cases that the operator should be present when the localization is made, as it is of paramount importance that the patient should be in the same position for operation as when the localization was carried out. (4) The localization should be made as short a time as possible before operation, owing to the liability of the metallic body shifting its position.

The skin is then marked by a small cross made with a sterilized surgical needle. The patient is taken immediately to the operating room and the following procedure is carried out. A telephone apparatus is connected, one electrode being placed on the sound limb of the patient, the other being connected with a sterilized probing needle. The needle is inserted at the cross-mark on the skin in the direction of the foreign body. When it touches the foreign body the circuit is completed and a distinct tapping sound is heard at the telephone receiver. A small incision is then made, and the

probing needle carefully followed until the foreign body is found along its course.

The advantages claimed for this particular type of bullet localization are as follows: (1) There is only one pole to strike the metal. (2) The pole consists of a sharp, long needle. (3) No skin incision is necessary for the detection of the metallic foreign body. (4) No damage is done to the tissues, for if no metallic foreign body is detected no incision is made. (5) That portion of the apparatus which approaches the area of operation is simple and inexpensive, easily replaced and can be readily sterilized.

The indications for removing a bullet or piece of shrapnel are as follows: (1) All superficial metallic foreign bodies which cause any discomfort or are likely to give trouble by their presence should be removed. (2) In gunshot wounds which do not heal, or where sepsis continues, if a foreign body is present it should be removed. (3) Deeply situated bullets or pieces of shrapnel should be removed from limbs if of large size and causing any inconvenience. If causing no inconvenience, they should not be disturbed. (4) Those situated within the thorax, unless easily reached, are better left alone. The author has seen two cases, with no symptoms, in one of which a round shrapnel bullet was lying on the summit of the arch of the aorta; in the other a piece of shrapnel casing was lodged on the right side of the arch. Both were left alone. (5) In the abdomen, if found on repeated localizations to be in the same position, the bullet should be removed. If on repeated examinations the bullet is found in different parts of the abdomen, it is probably free in the peritoneal cavity, and can be removed generally from the pelvis if the man has been walking about. Bullets so placed are treated much in the same way as other foreign bodies in the abdomen. Dame Nature wraps them round with adhering coils, and eventually they will be extruded *per vias naturales*. (6) In the head. Bullets situated in the scalp, in the face, or in the bony case of the skull should be removed, and, in the latter, portions of depressed inner tables should be looked for. If situated within the brain itself it is impossible to lay down general rules. If the wound is septic around the bullet, a large area of brain necrosis may be extruded, and the patient dies suddenly. Where the bullet is situated immediately under the skull, provided it has been carefully and accurately localized, it should be removed by the shortest route.

J. H. SKILES.

Turner, G. G.: The Importance of General Principles in Military Surgery. *Brit. M. J.*, 1916, i, 401.

The principles which underlie surgical practice in general are exactly the same as those which govern the injuries met with as the result of modern firearms. In nearly all the reports from the seat of war, the need of guidance by general principles is being recognized.

The peculiarities which undoubtedly exist are due to the nature of the weapons and to the conditions under which the wounds are received and in which the injured man has to exist for some time afterward. In other words, it is a question of environment rather than any inherent peculiarity in the wounds themselves.

It has been said that antiseptics in war surgery are of no value and some have gone so far as to infer that antiseptics are, therefore, useless in general.

The nature of many of the wounds, especially those produced by shells, makes them exceedingly difficult to cleanse, even under the most favorable circumstances, and to deal thoroughly with some of them would be quite a major operation, taking considerable time. Unless the body can be protected against sepsis by some means without local interference, the septic infection of a certain proportion of wounds sustained in warfare will certainly occur. For wounds already infected, boracic fomentations, gauze wrung out of 1:1,000 mercury perchloride and used while moist, or a solution of the same strength made with methylated spirit and, at times, irrigation with solutions of hydrogen peroxide or iodine water, are relied upon. One or two cases have been disappointing, but the great majority have done splendidly so far as wound healing is concerned.

All who have to deal with the wounded are insistent on the importance of drainage, and when one considers the undermining of the tissues, the masses of broken-down material that must be cast off by a suppurative process, and the pockets and side channels which so frequently occur, it is easy to understand the necessity of providing a free outlet for discharges.

Another important principle to be noted is the importance of fresh air in combating infections.

It is a principle in surgery, which is apt to be forgotten, that all the gross sources of sepsis ought first to be dealt with before falling back on vaccines, etc. It is very important to remove a septic focus.

In the great majority of cases it is wise to remove a foreign body, if this can be done without running any grave risk so far as the life of the patient or the function of the affected part are concerned. There are constantly admitted to the hospital patients whose wounds are healed and who have returned to duty, but who do not feel satisfied because of the knowledge of the presence of some extraneous foreign body in their anatomy. It makes all the difference in the world to a man whether his foreign body is in his chest wall or in his waistcoat pocket. It is, after all, a psychological matter in many cases, and if such a gross mechanical performance as a surgical operation can lift a permanent load from the patient's mind, then strong reasons are required for refusing to operate. Certain principles must always be kept in mind: First, one must clearly recognize that if good results cannot be secured one has not

the right to run the risk of doing serious harm. Secondly, no one should undertake the removal of a foreign body without very careful consideration as to its exact position and relation to surrounding structures. An operation for its removal should never be carried out without an X-ray examination, because so often there are multiple foreign bodies or there are concomitant injuries to bones which can be dealt with at the same time. No attempt should be made to remove foreign bodies without careful localization, unless they can be certainly felt near the surface. As the foreign body is always potentially a source of infection, the area from which it has been removed should always be drained.

Ill-considered attempts to remove small foreign bodies embedded in muscular parts should be avoided, and indeed they are of minor importance because they are not likely to give rise to much trouble in such situations.

At the beginning of the war and for some time afterward, foreign bodies in the chest were supposed to be in sacred ground and patients were universally advised to have them left alone. Being impressed with the amount of mental anguish which some of these men appeared to endure because of the knowledge that they had a foreign body in their lungs, the author has, on four occasions, deliberately opened the chest and removed bullets or shell casing, in each case with complete recovery.

Extensive comminution is the most characteristic feature of gunshot injuries of bone and may exist both with and without separation of the fragments. A bullet may pass through a bone, making a regular trephine opening with or without complete fracture or comminution, or the foreign body may be lodged in the bone or in the neighboring soft parts.

So far as the wounds are concerned, the same principles apply as in the treatment of compound fractures sustained in civil life. A most important point is to resist the temptation to remove loose fragments, for there is abundant evidence in surgery to show that bone is the best stimulus to the formation of bone. It is impossible to say how much bone will live or die; that question can only be settled by Nature, and in almost every instance she spares more than one would expect.

There is a great temptation to use plates and screws, but it is doubtful whether this is good practice in compound fractures. It will take a good deal of evidence to show that internal splinting is to be accepted as a principle in the treatment of gunshot injuries.

In most cases the principle of extension must be employed and this more so than in civil life because so often there is great shattering of the bone or actual loss of substance. To carry this out in the lower limb often causes much trouble, and a great deal of ingenuity has been exercised in the manufacture of apparatus for this purpose. In the upper limb the problem is simpler and for fractures the weight of the limb can usually be relied upon to secure the necessary amount of extension, and with excellent results. Most of the author's cases of gunshot fractures of the humerus are treated by suspending the wrist in a short sling, sometimes with the addition of pieces of gooching applied over the seat of fracture and fixed to the chest with a circular bandage.

The surprising way in which injuries to joints recover with a good range of movement has frequently been a matter for comment, but, nevertheless, all cases do not result so favorably. Since it is usually impossible to tell at an early stage of the case whether or not ankylosis will occur, it is very important to deal with these cases in such a way that, should such an untoward result follow, the limb will be in a useful position. This rule should always be followed whatever the cause of the joint injury, but it is especially exemplified by numbers of cases met with in military practice.

EDWARD L. CORNELL.

Camus, J., and Quiserne: Physical Treatment for Disabled Soldiers. *Lancet*, Lond., 1916, cxc, 691.

Results of the physical treatment for disabled soldiers are even more striking than had been supposed. A very large proportion are cured or so greatly improved that they are rendered again fit for military service. During the month of December, for example, 84 per cent of the officers and men discharged were thus fit after a mean duration of treatment of 40 days. Apart from military efficiency, it is easy to see what a saving in grants and pensions such a result implies.

It is necessary to supervise the men when the limit of beneficial result has been reached and to see that they then undergo a further special military training. At a certain stage, too, military exercises form an excellent supplement to the mechanical treatment and a group of invalided non-commissioned officers has been assigned to this work and their presence exerts a helpful influence on the men's recovery.

It has been found that movements made with very heavy weights by no means give the best results, and that the order in which the apparatus is employed is a matter of importance. Fatigue lessens the good results and the application should be continued only as far as the point at which movements become painful. The apparatus, as installed in many institutions on the Continent, is largely arranged for passive movements and hence requires driving force and machinery of a complicated nature. A great simplification for the purpose in hand has been introduced by the selection of twelve relatively simple pieces of apparatus for active movements alone.

Illustrations of these twelve machines, which have been found to provide all the essential movements, and two sets of which are stated to suffice for quite a large institution, are reproduced in the original article.

EDWARD L. CORNELL.

Isnardi, L.: Treatment of Septic Wounds Without Drainage (Cura delle ferite di guerra settiche senza drenaggio). *Gior. d. r. Accad. di med. di Torino*, 1915, lxxviii, 439.

Isnardi is opposed to the employment of drainage in the treatment of septic wounds. Of 290 wounds treated by him in the Reserve Hospital of Vercelli, 32 were very grave and septic. Most of them were fracture wounds. The treatment consisted in clearing the wound; immediate reduction of the fracture with traction apparatus; immobilization of the articulation; no examination with sound, radioscopic examination only; no searching for nor extraction of spiculæ, etc., unless apparent; no manipulation; plentiful use of gauze and absorbent cotton; immobilization and elevation of the limb. No drainage whatever is used. All the 32 cases have recovered with preservation of their limbs.

Isnardi is of the opinion that drainage and incisions disturb the progress of the reparatory process. Drains, whether gauze, rubber, or glass, are foreign bodies which irritate the tissues and give a harboring stronghold and breeding place to microbes. Incisions expose damaged tissues which would better recover under an intact skin. Drains do not favor the elimination of exudates. The track fissures made by the projectile will always offer a better pathway. W. A. BRENNAN.

Saint, C. F. M.: The Principles of Treatment and Their Application to Wounds. *Brit. M. J.*, 1916, i, 367.

The principles of treatment are: (1) remove the cause; (2) combat the effects; (3) assist the reaction; (4) prevent complications or deal with them if they have arisen.

Removal of the cause depends upon its location as to the probable presence or absence of infection. A superficial metallic body should be removed. When deeply placed it should not be removed unless there is probability of infection and proper X-ray equipment is at hand to aid in its localization. Under special circumstances even a sterile bullet may need to be removed; for example, when from its position it gives rise to irritation of nerves, interferes with the movements of a joint, etc.

In combating the effects the general condition of the patient is extremely important. Quiet and freedom from pain, secured if necessary by morphine, are absolutely essential. Stimulants must be given with caution, small doses frequently given being preferable to large doses. Transfusion is the chief remedy, saline being usually used, preferably by rectum or subcutaneously; but occasionally intravenously.

The treatment of the local condition involves the control of hæmorrhage, either by pad and pressure, forci-pressure, ligature, suture, or vessel suture. The importance of ascertaining that no tourniquet is left on a limb too long is emphasized.

In assisting the reaction the course followed depends upon the condition of the wound when the case arrives. Since most cases are infected an antiseptic is first used and the wound thoroughly cleansed. Aseptic wounds may be closed and primary unions secured.

The complications are numerous, one of the most important being sepsis. This is combated in numerous ways, many antiseptics being used. Hypochlorous acid is the most popular at present. Efficient drainage, lymph lavage, secured by hypertonic solutions and Bier's hyperæmia are all important in hastening recovery. The general resistance should be supported by fresh air, quiet, and plenty of nourishing food.

The following rules have been elaborated by the author for the treatment of head injuries.

1. The wound was dressed, the lotion used for the removal of the old dressing being 1 in 20 carbolic. Mercury perchloride was contra-indicated because iodine had invariably been used lavishly, often producing blistering. If further investigation proved to be necessary, the wound was packed with spirit gauze wrung out of 1 in 3,000 mercury biniodide.

2. An anæsthetic was administered.

3. The head was washed in 1 in 20 carbolic lotion, and the hair shaved off while the carbolic was dripped on, following the razor.

4. The bruised edges of the wound were trimmed with mouse-toothed forceps, knife and scissors, and the wound dried and swabbed throughout (including exposed brain) with pure carbolic acid. In more extensive wounds the excess of carbolic was neutralized by methylated spirit, otherwise it was mopped away.

5. A large flap was reflected, usually with the wound in its center.

6. The skull was trephined, all loose depressed bone removed, and projecting edges nibbled away. No extensive search was made for distant pieces of bone or foreign body. Bleeding was arrested by fine suture, muscle tissue, or packing.

7. Exposed brain and dura mater were covered with spirit gauze wrung out of 1 in 3,000 mercury biniodide, the free end being pulled through the original wound. A tube was introduced in some cases.

8. The operation wound was sutured with silkworm gut.

9. Three days later the gauze was removed; the tube might or might not be removed; if left it was removed at the next dressing.

10. Where the original wound resembled an incised wound, secondary sutures were inserted on the fifth or sixth day. In punctures this was not necessary, and in extensive laceration and destruction it was not possible. J. H. SKILES.

Soresi, A. L.: Painless, Rational, and Economic Treatment of Wounds (La cura indolere, razionale, ed economica delle ferite). *Gior. d. r. Accad. di med. di Torino*, 1915, lxxviii, 404.

Soresi claims many advantages in the use of paraffin in the surgical treatment of wounds, both

in its elimination of a great deal of the unnecessary pain caused by gauze dressings and drains, and also on account of its inert, sterile, and other qualities which prevent it from being in any way irritating to the tissues.

His method consists in the application of a paraffinized surface over the injured area and the covering of the drain tube with paraffin. The paraffin which is placed in a shallow dish is kept liquid by having the dish inserted in another containing warm water. A piece of gauze about the size of the surface to be covered is dipped in the paraffin. While the paraffin on the gauze is still tepid the gauze is placed over the wound and trimmed to size.

Drains are prepared of pieces of rolled gauze dipped in the paraffin; or, when the exudate is very abundant, a metal tube of very fine mesh is dipped in the paraffin, which must not be very warm, and when the paraffin becomes solid the tube is ready for use.

The advantage of this method is that the dressings or tubes are non-adherent and give rise to no pain, irritation, or hæmorrhage. W. A. BRENNAN.

Flint, J. M.: The Organization and Problems of a War Hospital. *Mil. Surgeon*, 1916, xxxviii, 405.

Professor Flint has had charge of an American hospital in France during the present war. Most of the cases which are severely wounded must be transferred to a base hospital such as is conducted by Flint, and the work at these institutions is extremely varied.

Localization and extraction of projectiles form one of the most interesting and frequent operations. Compound fractures are extremely numerous. Most of the cases are infected. Lesions of the nerves and blood-vessels are numerous, but still joints and chronic osteomyelitis form a large number of the old cases in any base hospital.

The hospital in question was originally a château situated in a park of about eighty acres, and the transformation of this into an efficient modern hospital necessitated a great deal of ingenuity and industry. A detailed description is given of the organization of the hospital, its personnel, and the efficient manner in which a large number of wounded may be taken care of in a short time.

J. H. SKILES.

Miller, R. B.: Proposed Equipment for the Hospital Corps Soldier. *Mil. Surgeon*, 1916, xxxviii, 421.

A board was recently organized by the war department to recommend improvements in the equipment for the hospital corps soldier. Two items especially were recommended for revision; i.e., the hospital corps pouch with its contents and the hospital corps knife. After much deliberation a new pouch was devised in the form of a belt with numerous compartments. A hand axe was substituted for the hospital corps knife. The advantages claimed for the proposed equipment are as follows:

1. It is more comfortable to the wearer.
2. It weighs less.
3. The weight is uniformly distributed.
4. There are no constricting straps across the chest.
5. No part of the equipment hangs about the soldiers' legs, interfering with locomotion.
6. It is more durable.
7. It is more military in appearance.

J. H. SKILES.

Savill, A.: Some Notes on the X-Ray Department of the Scottish Women's Hospital, Royaumont, France. *Arch. Radiol. & Electrotherap.*, 1916, xx, 401.

The author gives a very interesting and detailed description of the founding of the first French unit of the Scottish Women's Hospital at the Abbaye de Royaumont, twenty-five miles behind the firing line. An X-ray department was established after many seemingly insurmountable obstacles had been overcome. Although electrical energy was available to supply a limited number of lamps in the wards and operating theater, there was not sufficient for running the X-ray from the main. Resource was finally made to a set of 36-ampere-hour accumulators which was placed in the X-ray room. It was necessary to charge these daily, but they yielded very satisfactory results.

A number of interesting case reports, accompanied by illustrative roentgenograms, are included. Of especial interest are those in which foreign bodies were not extracted because they apparently gave no trouble. In many of these, the foreign bodies, apparently long quiescent, would likely someday become the seat of troublesome abscesses.

As the first installation did not include a stereoscope, the Hampson method of localization was employed in most instances, and later the Behiern compass for localizing foreign bodies in the limbs, although this method involves even more screening than the Hampson method. The method most favored by French surgeons was the Hirtz compass. In spite of the great disadvantages and difficulties under which it was necessary to make examinations and localizations, astonishingly good results were obtained. W. A. EVANS.

SURGICAL DIAGNOSIS

Sewall, H.: The Clinical Relations of Gravity, Posture, and Circulation. *Am. J. M. Sc.*, 1916, cli, 491.

The vascular system, says Sewall, is everywhere in a state of "tone" by which its capacity is actively reduced. This tonicity keeps the blood from stagnating, under the influence of gravitation, in the capacious reservoirs of the abdomen.

The rigidity of the skull keeps the brain relatively full of blood even with a zero of arterial pressure. In the abdomen, on the other hand, the blood-vessels find less support, perhaps, than in any other situa-

tion. The physiological integrity of the splanchnic vasomotor system and of the musculature of the abdominal wall form the chief or only extraneous limitations to expansion of the great "abdominal reservoir."

The splanchnic vasomotor mechanism is sufficient to compensate for the effect of gravity on the blood supply of the brain. Deficient vasomotor tone combined with an atonic condition of the abdominal wall or patulous abdomen must in the erect posture lead to deficient circulation in the brain, and cerebral anæmia, as well as oligæmia of the general circulation.

In the normal subject the fall of carotid blood-pressure, which tends to occur on changing from the recumbent to the erect posture, leads to stimulation of the splanchnic vasomotor center; at the same time the tension of the muscles of the abdominal wall is apparently increased, as is evidenced by the difficulty found in making a satisfactory palpatory examination of the abdomen with the patient upright. In these ways the hydrostatic pressure tending to surcharge the splanchnic veins is compensated, so that with the venous outflow from the brain accelerated by gravity and the arterial inflow kept high by elevation of systemic arterial pressure the nourishment of the brain may be expected to flourish in the erect posture.

In the debilitated individual we must expect to witness the preponderance of gravity effects proportional to the weakening of the physiological powers which had held it in compensation. Now, in the erect posture the blood actually stagnates to a degree in the splanchnic veins at the expense of the systemic circulation and the blood-pressure in the brachial artery falls.

In the group of complaining more or less healthy-looking women in whom it is difficult to localize the pathological condition, and which the physician commonly characterizes as "neurasthenic," measures taken to support the abdominal circulation often seem to give better results than any other, whether or not there is evidence of enteroptosis.

The one physical sign which seems indicative of general, and especially of intracranial, hydrostatic circulatory deficiency is to be found in the postural changes of the blood-pressures. In the normal person in the erect, at least in the sitting, posture, the blood-pressure is higher than when recumbent. When the blood-pressures, especially the maximal, are found higher in the recumbent than in the sitting posture, Sewall concludes there is physiological weakness either of the splanchnic vasomotor system, of the abdominal wall, or both, and that potential cerebral anæmia and vasomotor overstrain are consequences in the erect posture.

The treatment of abdominal circulatory stasis consists in respiratory and resistance exercises, each exertion followed by a period of rest in the recumbent posture. Baths with alternating temperatures, conjoined with massage, have a favorable effect. The subject should lie down for an hour after each meal and during the latter half of this period a bag of shot weighing ten to fifteen pounds should be placed on the abdomen. Exercises especially adapted to strengthening the abdominal muscles should be employed, such as the rowing machine. To relieve morbid symptoms in the quickest way an artificial support such as a belt, band, or corset should be applied over the lower abdomen.

Sewall concludes that splanchnic stasis is potentially present, and may be the starting-point for vicious circles of derangement, in every case of general functional weakness. Laxness of the abdominal wall probably leads, in the erect posture, to the establishment of a negative pressure within the abdomen, which it is a prime object of treatment to correct. Depletion of the intracranial blood current must follow insufficient compensation of the hydrostatic pressure involved in the erect posture. Virtual anæmia of the brain leading to a multiplicity of disorders is the natural sequence. It is probable that excess of blood-pressure in the recumbent as compared with the erect posture is a trustworthy index of splanchnic stasis. A. EHRENFRIED.

MEDICOLEGAL, HOSPITAL, MEDICAL EDUCATION

Malpractice; Expert Evidence as to Treatment; Patient's Duty to Minimize Damage. *Med. Rec.*, 1916, lxxxix, 608.

The case of Dahl vs. Wagner, 151 Pac. 1079, was that of a suit against a doctor for malpractice in which the plaintiff succeeded in obtaining a verdict against the attending physician. The facts stated briefly are as follows:

The plaintiff, a workman, sustained injuries to his foot consisting of a dislocation of one of the bones and other injuries and bruises. The defendant physician was under contract with the plaintiff's employer to treat the plaintiff under what was called the hospital fee system. Infection followed the wound and the plaintiff was confined in the hospital for over six weeks. After leaving the hospital he called a number of times upon the defendant for treatment. At these visits the defendant advised him to use the foot and do some light work and told him that he would probably have a good foot. The dislocated cuneiform bone was pressed downward and forward to such an extent that the protruding end of the bone carried the weight of the body, causing pain. The specific allegation of the defendant's negligence was that the defendant had neglected to properly reset the bones by manipulation and had failed to perform an operation by cutting the foot open and forcing the dislocated bone back into place.

The jury returned a verdict in favor of the plaintiff, but the trial judge set aside the verdict and entered judgment "*non obstante veredictum*" for the defendant. The case was appealed by the plaintiff and on appeal the above facts were practically undisputed.

The main point in issue was: Was the defendant guilty of malpractice in not attempting to set the dislocated bones by manipulation; the time passing when this should have been done, should the defendant have performed an operation? A medical expert for the plaintiff expressed the opinion that if there was swelling and infection during the acute stage, an effort should have been made thereafter to restore the functions of the foot; the presence of the swelling and infection would prevent resetting or operation during the acute stage. The sooner the swelling was reduced the better. Medical experts for the defendant testified that it would have been foolhardy to attempt to reset the bones in any way until all danger of infection had passed and the wound healed completely; that the cutting of the tissues prior to this time would have been hazardous; that the bone would not have remained in place, if set; that an operation might have made the dormant infective germs active, threatening the loss of the foot and possibly the life of the patient; that the duty of the operating or attending surgeon was first to look to the life of the patient. They testified that the services of the defendant were in keeping with the proper teachings of surgery.

The reviewing court says in substance that where the unimpeached testimony of doctors of equal skill and learning disagree on a given state of facts, the courts cannot hold to the theory of one to the exclusion of the others; that if a number of witnesses recognize the method of procedure as proper and approve of it, the court could not hold the surgeon guilty of malpractice, giving reasons as follows:

That a surgeon is called upon to exercise only reasonable care, learning, and diligence in his profession, and if he uses a method recognized and approved by members of his profession of equal learning and standing, he should not be held liable for mistakes, nor will the court deem a man guilty of malpractice where doctors disagree as to methods of treatment even though a more modern method than the one adopted is suggested as the standard. It is the duty of the attending surgeon to do all that is reasonable within the limits of professional skill to relieve pain and suffering.

The question then arises: Did the defendant in the case at bar violate any duty to the plaintiff after the plaintiff had left the hospital? The court holds that although the doctor's contract with the employer of the plaintiff terminated at the time the plaintiff left the hospital, his duty to the plaintiff was a continuing one, continuing to the limit of reasonable professional ability. It being reasonably clear that an operation was, at the time of trial, necessary and would probably relieve the suffering so far endured by the plaintiff, and evidence being offered to show that the reasonable cost of such operation would approximate $200.00, the court therefore directed a judgment for the plaintiff of $200.00. However, the defendant was not held liable for the pain and suffering pending an operation. The reason was that the defendant was responsible for the original injury, being only answerable for proper care and treatment, and because at the time the plaintiff left the hospital he consulted another surgeon and was advised that an operation would relieve him. He was under a legal duty to minimize his damages. It followed, therefore, that he could not recover for the continued pain and suffering, because it was his duty, if he thought he had been maltreated, to have the operation performed and bring suit for the reasonable costs thereof.

J. A. CASTAGNINO.

GYNECOLOGY

UTERUS

Carvallo, C.: The Technique of a New Procedure for Subtotal Abdominal Hysterectomy in Cases of Uterine Fibroma or Inflammation of the Adnexæ. *Surg., Gynec. & Obst.*, 1916, xxii, 614.

For some time past the author has performed subtotal abdominal hysterectomies in cases of uterine fibroma or inflammation of the adnexæ by what he considers an improvement of various methods already known. The improvement in his method he claims to be founded in the fact that the circulation of the uterus and the adnexæ is controlled by means of one forceps.

The technique is as follows: After a median laparotomy incision is made, the fundus is pulled as high as possible with a histerolab and then flexed toward the pubis.

The thumb and the index-finger of the left hand grasp the broad ligament just outside the adnexæ and seek the cervix through the walls of the vagina, ascending slowly from there to the point where the beating of the uterine vessels is felt. The right hand seizes a pair of strong long forceps with flexible points and compresses the area covered by the thumb and the index-finger of the left hand. The whole breadth of the broad ligament is thus compressed above the point of the forceps which touch the borders of the cervix, and the forceps are slowly but tightly locked to completely close the three arteries of the uterus.

The section of the broad ligaments and the cervix is carried out from left to right following the edges of the forceps. The ligature of the uterine arteries is made directly if the ends are still visible, or, if not, by a U-shaped ligature below the forceps. The funicular and the ovarian arteries are ligated in connection with the peritonization.

The peritonization is made with catgut and a pedicle needle. The needle is passed all around the stem of the *pedicule infundibulum pelvicum;* the loop is closed and the ovarian vessel ligated. Stitches are then made in a way that spirals formed by the catgut enclose both the borders of the remaining part of the broad ligament and, the forceps compressing this part, one of these spirals encloses the artery of the round ligament. When the cervix is reached the forceps are removed and the catgut pulled just as if it were a curtain string. The ligation and peritonization of the cervix and of the other half are done in the same way.

The advantages of the method are: (1) the use of few instruments; (2) the absence of bleeding; (3) the ease with which the peritonization is accomplished; and (4) the avoidance of injury to the ureters and the bladder.

Laroque, G. P.: The First 118 Cases of Operation for Posterior Displacement of the Uterus. *Am. J. Surg.*, 1916, xxx, 151.

In the 118 cases that furnish the basis of the author's report, suspension was performed 117 times: in 30 of the early cases by the Gilliam technique; in some by the so-called Kelly method; in a few the temporary suspension of Ochsner was used and, as a part of the treatment for extensive suppurative disease in one case, the uterus was held up as a result of shortening the broad ligaments incident to removal of pus tubes; in one case hysterectomy was performed; in 83 cases of this group the Johnston-Willis operation was employed.

This method has given complete satisfaction. It conforms to the standard principles necessary in performing suspension; it produces no abnormality and it is what the author calls the anatomic method. It is followed by the least pain during convalescence and, above all, the end-results, both as to position of the uterus and the relief of symptoms, have been perfect. All the cases have been followed at least three months and most of them examined again. Some reports have come from patients and from doctors in many cases after from three to five years. Many of the women have given birth to children since the operation without difficulty. Dilatation of the cervix was performed in all. Curettage was necessary in a goodly number of cases. Repair work, either of the cervix or perineum or both, was necessary in 58 of the 118 cases. Removal of the tube, or of an ovary, or of an ovarian cyst, in conjunction with suspension, has been recorded in 41 cases. In 4 cases myomectomy was performed for subserous fibroids. The appendix was invariably removed in every case in which the abdomen was opened to suspend the uterus unless it had been previously removed. Seventy-eight cases showed disease of the appendix. There has been no mortality either from the disease or from the operation.

EDWARD L. CORNELL.

Kellogg, J. H.: A Simple Method of Shortening the Round Ligaments of the Uterus for the Cure of Retroversion. *Med. Rec.*, 1916, lxxxix, 719.

The method which the author describes has been used by him for more than twenty-seven years. He has employed it in more than 1,600 cases, and many other surgeons also have used it extensively.

In this operation almost without exception a curettage is required when the uterus has been long retroverted, as a pathological condition of the endometrium is almost invariably present.

When the pelvic floor is greatly weakened, result-

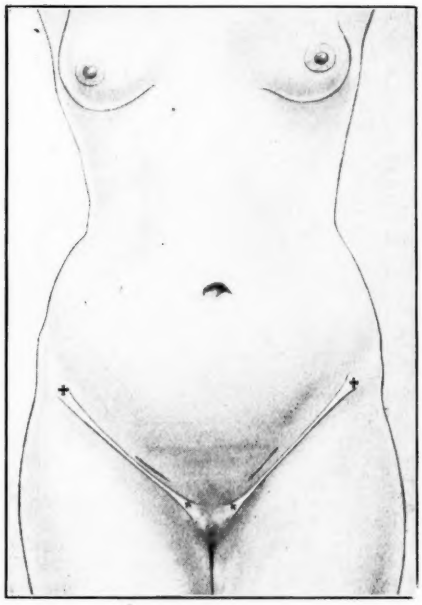

Fig. 1. Skin incision (a—a).

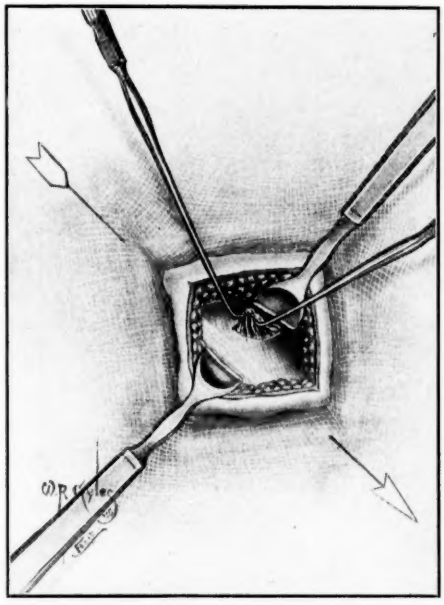

Fig. 2. Picking up ligament.

ing in rectocele or cystocele, these conditions must be corrected by a plastic operation.

Before or after the curettage the uterus is carefully replaced by bimanual manipulation. Great care must be taken to see that both the uterus and the appendages are brought well forward. When released, the uterus should remain in position. If it falls backward at once, or settles down into a retroverted position, adhesions are probably present.

When marked anteflexion or retroflexion exists a stem pessary is introduced. A carefully fitted lever pessary is placed to support the fundus and to prevent all straining upon the ligaments. The pessaries are usually retained for two or three months while the intestines are becoming readjusted and the abdominal walls strengthened.

A separate incision is required for each ligament (Fig. 1), and it is important that the incision should be made at the right point. With the finger in the middle of Poupart's ligament the incision is started at a point about one centimeter nearer to the pubic spine and two centimeters internal to the ligament of Poupart.

After the skin has been incised, the remaining dissection is made entirely with the blunt hooks. The two points of the hooks are placed together in the center of the wound, pressed into the tissues, and separated by drawing toward the angles of the wound. By lifting the angles of the wound with the hooks, the wound is made to gape and the retractors are then introduced, first one, then the other; this procedure is repeated as many times as may be necessary to reach the aponeurosis of the external oblique. When the aponeurosis first comes into sight it must be divided and drawn aside by the retractors in order to bring Poupart's ligament plainly into view.

Fixing a point along the ligament about one-third the distance from the pubic spine to the arterior superior spine of the ilium, one centimeter internal to this point, a puncture is made through the roof of the inguinal canal with the blunt hook held in the left hand and the tendinous fibers of the aponeurosis are split for about one-half centimeter and the other hook introduced with the point turned outward toward Poupart's ligament. The hook is dipped close beneath Poupart's ligament, and whatever the hook engages is carefully pulled up (Fig. 2.) If the ligament does not appear, the hook is introduced again and made to explore the tissues one or two centimeters in each direction along Poupart's ligament. If the ligament is not discovered, the hook is turned inward and an effort made to find it beneath the outer border of the internal oblique, where it is sometimes found.

The round ligament may be recognized by the following factors: (1) It is a distinct structure. (2) It differs in color from other structures, looks white like a tendon, although not quite so smooth and glistening as a tendon. (3) Over the surface of the ligament small tortuous veins may be seen which disappear when traction is made upon the ligament

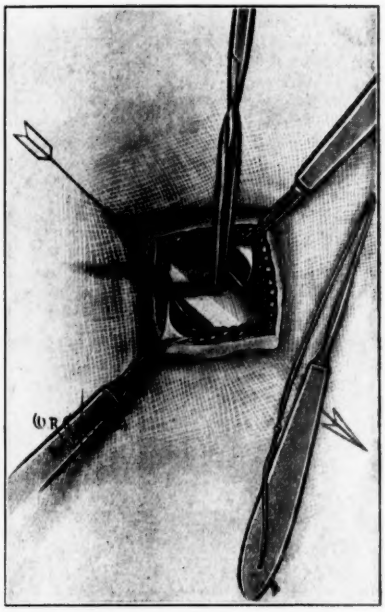

Fig. 3. Ligament fully drawn out and peritoneum stripped off.

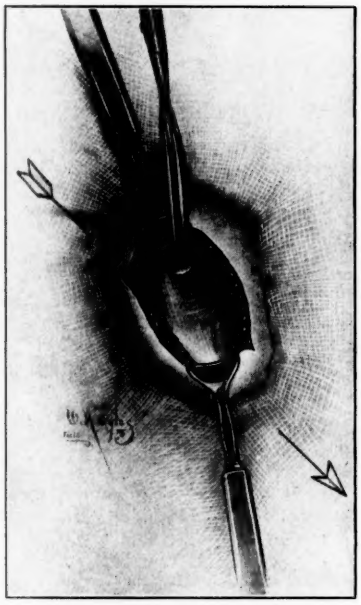

Fig. 4. Ligament drawn out above the external ring.

and fill when the tension is relaxed. It should be noted that these veins are sometimes greatly enlarged and varicose. (4) The ligament is pulled out more easily than other structures. When, however, the nerve which comes with the ligament is caught with it by the hook, the ligament is held back somewhat, but by separating or cutting the nerve the ligament may be very easily drawn up and does not snap back into the canal, as do other tissues when released.

Failure to find the ligament may be due to several causes:

1. The ligament may be drawn down under the internal oblique to an unusual degree by long continuous and excessive strain.

2. In very stout persons, the ligament may be buried in fat in the lower part of the canal.

3. The ligament is sometimes obscured by a mass of veins, due to a condition analogous to varicocele in men.

4. A more common cause of failure is incorrect placing of the incision or of the puncture through the roof of the inguinal canal. The ligament must be sought in exactly the right spot as above described. If the hook is introduced even one centimeter away from the proper point, the ligament will be found only with much difficulty.

The ligament should always be sought at the outer border of the internal oblique and should be drawn out from under the muscle instead of being pulled up through it.

5. The ligament is sometimes so slender that its recognition is very difficult. Small ligaments are most likely to be found in poorly developed women who have not borne children and in whom the uterus is retroverted to an extreme degree.

6. The ligament is sometimes so large that it is not readily caught by the hook, and one is sometimes surprised after several minutes of fruitless search by the sudden appearance of a large, strong ligament, fully half a centimeter in diameter.

7. The ligament is sometimes invested by fascia and fat and not so easily recognizable as in normal cases.

8. Anomalous conditions of the ligament are sometimes, though very rarely, found. In 1,603 cases the author has encountered conditions which may fairly be regarded as anomalous in not more than half a dozen instances.

9. Occasionally the ligaments are held back by adhesions, the result of pelvic cellulitis involving the round ligaments.

The ligament should not be seized with forceps. Traction is made while the pouch of peritoneum, which forms the canal of Nuck, and other tissues are separated and pushed back along the ligament with narrow-bladed forceps which are not released when the peritoneum is fully stripped back but remain attached as one pair after another is used.

As the peritoneum is stripped off, the ligament may be pulled out more and more, until finally so much resistance is felt that the uterus appears to be drawn up against the abdominal wall in the suprapubic region. The ligament will be seven to nine centimeters in length, representing a shortening of fourteen to eighteen centimeters. No matter how slender the distal portion of the ligament may be, the proximal portion at the point where it emerges from the canal will show a width of half a centimeter to three centimeters.

The ligament having been fully drawn out (Fig. 3), the next step is to attach it at its thickest part to the aponeurosis of the external oblique at the upper angle of the puncture by means of a strong chromicized gut suture passed from beneath the aponeurosis. A ligature is now applied to the shreds of peritoneum held by the forceps. This closes the canal of Nuck and also ligates vessels which might be a source of trouble.

If the ligament is anchored in this position by attaching the loop of surplus ligament to the anterior surface of the external oblique muscle, the patient may possibly sooner or later develop hernia, as the small intestine will gradually work its way out alongside the round ligament. To obviate this danger the loop of ligament is drawn back into the canal and pulled up through the aponeurosis at a point five or six centimeters higher up and toward the median line. To accomplish this an aneurism needle is passed into the canal along the inner side of the ligament and made to emerge at a point five or six centimeters higher up and two or three centimeters toward the median line. About an inch of the loop of ligament is passed through the silk loop and the ligament is drawn back into the canal and up through the aponeurosis. By this means all danger of hernia is eliminated (Fig. 4).

The end of the loop of ligament is again drawn under the aponeurosis of the external oblique and made to emerge at the original opening through which it was first pulled out. Thus the surplus ligament is woven into the aponeurosis of the external oblique, to which it in a few days becomes firmly attached, forming a very secure and permanent anchorage for the ligament (Fig. 15).

The next step is to close the opening in the roof of the canal. Care is taken to pass the suture through the end of the loop of ligament so that when the opening in the aponeurosis of the external oblique is closed the ligament is closely applied to the underside. The roof of the inguinal canal is thus reinforced instead of being weakened.

The superficial fascia is closed with No. 1 plain catgut, and the edges of the skin incision are approximated by two or three skin clips.

The advantages claimed for this method of operation over other methods are:

1. The abdomen is not opened, hence there is no shock and no risk of formation of peritoneal adhesions and no abnormal conditions created which might lead to intestinal obstruction.

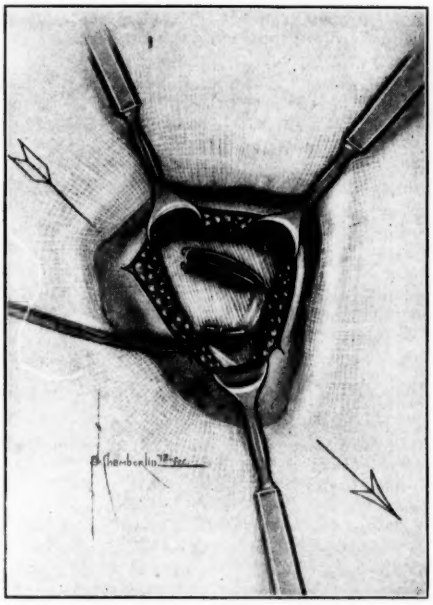

Fig. 5. End of ligament drawn out through original opening in roof of canal.

2. The ligament is so secured that the recurrence of prolapse is almost impossible. In the original method of Alexander the ligament was cut off and attached to the fascia about the spine of the pubes. This method did not give secure anchorage and frequently resulted in complete failure because the ligament tore loose.

3. The ligament is not injured and no mutilation of any sort occurs, so the patient cannot possibly be made worse, as not infrequently occurs with several other methods.

4. The technique is simple and the operation may be quickly done. The time required is rarely more than fifteen minutes and often only ten or twelve minutes for both sides.

5. The small and superficial incision and the short time occupied by the operation give no occasion for shock.

6. The operation does not give rise to complications in pregnancy as do some other methods.

7. The results, when the cases are properly selected, are better than those obtained from other methods.

Conditions which contra-indicate shortening of the round ligaments by this method are:

1. Procidentia, in which the ligaments are not strong enough to sustain the weight of the entire abdominal contents, and a more radical procedure is necessary.

2. The absence of symptoms as in cases of retroversion of long standing in which the uterus is small and free from disease, as often noted in women who have passed the menopause.

3. The presence of adhesions of the uterus, tubes, or ovaries either to the pelvic walls or to other pelvic viscera, unless very slight.

The following suggestions are made as to the after-care:

1. The patient should be kept in bed or in a reclining position most of the time for a week or two, but may sit up some, go out in a wheel chair, and walk about some each day.

2. The lever pessary applied at the time of the operation is retained for three or four months.

3. A spring abdominal supporter is adjusted when the dressings are removed and must be worn constantly, except at night, until the abdominal muscles become strong enough to support the viscera.

4. The bowels must be trained to move normally without straining. This should be accomplished before the operation.

5. The abdominal muscles must be developed to enable them to support the abdominal viscera in a normal way. This must be accomplished by systematic and carefully graduated exercises.

6. The corset and tight bands must be discarded definitely and permanently.

The patient must live the "simple life," and must make the care of the health a matter of serious and constant concern. It is especially important that she should understand that the operation alone may not effect a permanent cure, but that with her thorough co-operation it makes a permanent cure possible.

ADNEXAL AND PERIUTERINE CONDITIONS

Rosenow, E. C., and Davis, C. H.: The Bacteriology and Experimental Production of Ovaritis. *J. Am. M. Ass.*, 1916, lxvi, 1175.

The authors record briefly the results of cultures made from the tissues and cystic fluid in a series of 64 ovaries removed at operation. The histories of a few illustrative cases and the results of animal experimentation made with some of the strains isolated are given.

Of 3 patients with acute tubo-ovarian abscesses, 2 showed pure cultures of streptococcus viridans in countless numbers in the involved tissues. The pus of one of these was sterile, while the other showed a moderate number of the same streptococcus. The third case yielded gonococci in large numbers. In 10 cases the cultures remained permanently sterile. In the remaining 51 cases, in which the ovaries showed the usual fibrocystic degeneration, streptococci were isolated in 29, the number of the colonies ranging from one or relatively few, usually in the depths of the ascites-dextrose agar, to hundreds, and in a few instances to countless numbers. They were present in pure culture in 7 cases and associated in the others with the welch bacillus and a few staphylococci or colon bacilli. Welch bacilli were found in small numbers in 21 cases, diphtheroid-like bacilli in 10, a few colonies of staphylococcus albus in 9, the gonococcus in 2, the colon bacillus in 3, and an aerobic streptothrix in one.

The following facts support the view that the streptococci isolated from the chronic lesions when there was no history of a previous acute infection, as well as those causing acute infections of the ovary, are carried to these structures by the blood more often than is generally believed:

1. The occurrence of fibrocystic degeneration of the ovaries in which the usual streptococcus was isolated in pure form in a young woman with imperforate vagina.

2. The history of tonsillitis followed by symptoms of pelvic infection in a number of patients in the series.

3. The not uncommon occurrence of pelvic infection noted in gynecologic practice following anginal attacks during the menstrual period.

4. The far more frequent occurrence of so-called idiopathic streptococcal peritonitis following anginal attacks, in the female than the male, which, according to Wilder, who reviews the literature and reports a case in point, is due to the occurrence of a primary hæmatogenous ovaritis and a secondary peritonitis.

5. The absence of colon bacilli in all but three ovaries in this series, a fact contrary to expectations if local invasion occurred commonly.

6. The frequent concurrence of appendicitis, cholecystitis, and arthritis in these patients, diseases proved to be due usually to streptococci from a distant focus of infection.

The occurrence of fibrous and cystic degeneration in the ovary secondary to acute infection is already well established. But, as pointed out, the cause of this condition without an acute infection had not previously been worked out. In this work the authors have isolated streptococci, often in pure culture, and demonstrated them in the tissues in the areas showing infiltration, roughly in proportion to the amount of tissue reaction in a large proportion of the ovaries studied. Two of the strains isolated showed a marked affinity for the ovary in two species of animals — rabbit and dog — producing hæmorrhage and leucocytic infiltration (precursors of sclerotic changes) in and surrounding the graafian follicles and in the ovarian tissue stroma containing interstitial cells in the fully developed corpus luteum in a pregnant rabbit.

Hence, the conclusion seems warranted that fibrocystic degeneration of the ovary even in the absence of previous acute infection is due commonly to a low grade hæmatogenous infection by streptococci having elective affinity for these structures. Owing to the fact, however, that the number of bacteria found is relatively small and that the experimental lesions in the ovary are not due to an overwhelming growth, it is clear that while excision

and resection of ovaries is indicated in some instances, it should no longer be done without due regard for the existence of chronic foci of infection which may serve not only as the place of entrance but also as the place for the bacteria to acquire the peculiar properties necessary to infect the ovary. There is little indication for the removal of this type of ovary with the idea that it may play the rôle of a secondary focus of infection, yet the second case in the series indicates that this at times is possible. The results suggest, however, that the early eradication of primary foci of infection in this type of patient might in some cases prevent the premature sclerotic degeneration of the ovary.

McGlinn, J. A.: The End-Result of Resection of the Ovaries for Microcystic Disease. *Am. J. Obst.*, N. Y., 1916, lxxiii, 435.

From his own experience and that of other operators the author concludes that there is nothing to be gained by resecting the ovary which has undergone small cystic degeneration. He believes that resection tends to make the condition worse and either removes the more diseased ovary or simply punctures the cysts which are near the surface. The associated pathology in the pelvis must also be cleaned up. Following the operation the patients are treated to relieve pelvic congestion and if possible to prevent its future development. Five brief histories are given to show the futility of resecting the ovaries.

C. H. Davis.

Llewellyn, T. H., and Block, F. B.: Hydrops Tubæ Profluens. *J. Am. M. Ass.*, 1916, lxvi, 1018.

The patient was a very stout woman, aged 33. She had been married for fourteen years, but had one child some years previous, and no miscarriages. The menstrual periods were never regular. Every other month the flow was profuse, while in the intervening month it was scanty. The previous history presented nothing of importance, except that she had had her left tube removed four years before. She complained of throbbing pains in the sacral and right ovarian regions, associated with a vaginal discharge. A short time before, while stepping from the sidewalk to the street, she felt a sharp stabbing pain in the right side and felt a sensation as though "something burst." Immediately afterward a brownish discharge issued from the vagina and has continued to do so ever since.

At operation the left ovary was found to be transformed into a follicular cyst about the size of a peach; the right tube was enlarged and contained fluid, while the right ovary seemed to be in good condition. The operation consisted of a supravaginal hysterectomy, right salpingectomy, and left oophorocystectomy. On examination of the pathologic specimen after the operation was completed, it was found that when gentle pressure was made on the tube, there was a flow of clear, watery fluid from the tubal ostium at the uterine cornu.

Edward L. Cornell.

EXTERNAL GENITALIA

Salvador, J.: A Case of External Genital Deformity in a Woman Due to Retardation in Morphologic Evolution (Un caso de deformacion genital externa en la mujer por detencion en la evolucion morfologica). *Semaine méd.*, 1916, xxiii, 208.

The author reports a case of external genital deformity, i.e., abnormal enlargement of the vestibular canal. The woman was 25, married four years, and a nullipara. Coitus had always been very painful. Examination showed her to be a well-formed woman with a vestibular canal abnormally developed from the anterior part of the urogenital tract and with a perforate unruptured hymen, without other visible abnormality. The vulva was that of a nullipara. The vagina was short, only 6 cm., but very wide. There was no apparent hymen nor nymphohymeneal sulcus; there was no extension from the navicular fossa. The hymen was situated deeply within the vestibular canal and abnormally developed in front, the vaginal canal being behind it.

The immediate cause of the anatomic conditions giving rise to this deformity was retardation in morphologic evolution (according to Pozzi) and not interruption in the organic growth. The organ represents a fœtal type but without aplasia. It is due to a pathologic intervention during embryonic life.

On account of this abnormal condition conjugal relations were incomplete and painful and the woman was in a hopeless state of sterility. Added to this she had for the past two years been annoyed by an abundant mucopurulent leucorrhœa.

The treatment indicated was surgical and the author made a hymenotomy followed by a double colpoplasty with good results. However, he is of the opinion that if pregnancy should result and go to term the stricture of a portion of the vaginal canal would undoubtedly cause dystocia.

W. A. Brennan.

Young, E. B.: A Simple After-Treatment for Perineal Wounds. *Boston M. & S. J.*, 1916, clxxiv, 651.

The method at the Boston City Hospital has been used for nearly ten years and has been generally adopted for some time as the standard treatment. The aim is to maintain the greatest possible degree of cleanliness and dryness, as under such conditions infection and irritation are least likely to occur.

After twenty-four hours, when the bleeding has ceased, the gauze perineal pad is omitted and the genitals and fissure between the buttocks kept liberally covered with a drying and antiseptic powder. For this purpose various mixtures have been used, the best being the compound stearate of zinc with boric acid. Results have been good with the stearate of zinc alone, but rather better with the boric acid added as there is less tendency to decomposition of whatever discharge may come from the wound or elsewhere. The great advantage of

the stearate of zinc is that it sheds water and keeps the parts dry. In practice it has been found that mixtures of stearate of zinc and boric acid made by the physician are not so satisfactory as those prepared by the pharmaceutical firms.

The powder is best applied with the patient lying on the side, the upper buttock being raised and the powder thrown into every fold. It is not sufficient to dust lightly or use the powder blower. The parts must be thickly covered, especially between the buttocks, and kept so throughout the healing if the best results are to be obtained. Although the powder gradually becomes moist, it gives excellent protection to the skin, is mildly antiseptic, and sheds water to an amazing degree. With reasonable care it is usually possible to maintain absolute dryness.

If, as occasionally happens, there is considerable tendency to moisture and maceration of the skin, the application of a 10 per cent aqueous solution of icthyol before dusting with the powder will be found effective.

The patient, free from any dressing, lies upon a small pad which collects any discharge from the vagina or elsewhere and can be changed whenever necessary. The genitals are carefully washed after urination and defecation and as often as may otherwise seem necessary.

The advantages claimed for this method of treatment are dryness of the parts and hence less tendency to irritation and infection. There is also no perineal dressing to increase perspiration, absorb discharges, and form a poultice.

EDWARD L. CORNELL.

MISCELLANEOUS

Barnes, F. M., Jr.: Psychiatry and Gynecology. *Surg., Gynec. & Obst.*, 1916, xxii, 579.

The origin of the belief in the causal relationship of genital to mental disorder, a review of the theories which have been advanced in explanation of the character of such relationship, and an analysis of the data which has been presented in support of such theories are considered. Absolutely contradictory views have been held at different periods and the full gamut has been run from advisement of complete oophorectomy in genitally normal females to non-operative treatment in females with demonstrable genital disease. Of the various theories which have been proposed the toxic and endocrinic are today receiving the greatest attention.

The facts available do not warrant the assumption that diseases of the ovary or disorders of its internal secretion are in themselves responsible for the production of any psychosis. Statistics do not bear out the contention that gynecologic disease deserves the importance credited to it by some. The vast majority of mental cures reported have occurred in psychoses which were more or less acute and self-limited. Where operative indications exist, and it is now the consensus of opinion that these are the same in the insane as the sane, the results obtained by operation have been considered apart from the possible effect of such measures as are instituted during the period of post-operative care.

Although the menstrual period is accompanied normally by a certain group of phenomena referable in part to alterations of function of the nervous system and although these are sometimes exaggerated in so-called "nervous women," it has not been shown that menstruation itself is the cause of a psychosis. The calm judgment of the majority, both psychiatrists and gynecologists, tends at present strongly to the belief that a cause of insanity is not to be found in female genital disease or dysfunction, and that gynecological treatment, even where indicated by the gynecological condition, cannot be recommended as a cure for psychoses.

Tuley, H. E.: Hydatidiform Mole. *Louisville Month. J.*, 1916, xxii, 339.

The author reports a case of hydatidiform mole occurring in a primipara 27 years old. The last regular menstruation occurred July 27, and the usual early symptoms of pregnancy were noted. A slight flow began in September, and continued until the mole was expelled. In November the fundus was two finger-breadths below the umbilicus, the cervix was soft, and the uterus had a decidedly boggy feel. On December 7 the mole was expelled. No fœtus was found. There was no operative treatment, but the patient is being kept under close observation on account of the possibility of deciduoma malignum following a case of vesicular mole. This point was emphasized in the discussion. The anomalous features of this case were that there had been no excessive hæmorrhage and no cysts had been expelled. It was further pointed out that normal pregnancy and labor can occur after the expulsion of such a cyst.

C. D. HAUCH.

Vignes, H.: Experimental Researches on the Mechanism of Menstruation (Recherches sur le mechanisme de la menstruation). *Ann. de gynéc. et d'obst.*, 1916, xlii, 104.

From Vignes' experiments both *in vitro* and on living animals he finds that the ovule attracts to itself a certain number of heterogenous and autogenous toxic substances. Certain of these substances are necessary for the development of the ovule. However, the method of their production is not known.

In whatever way the phenomena of ovulation are produced, there is produced at the same time modification of the uterine mucosa which prepares it for nidation. If this is not effected menstrual hæmorrhage is produced and this hæmorrhage carries off at once all the reserves prepared for the early stages of development.

Menstruation is not only a cellular abortion, the abortion of an ovule, but it is a chemical abortion.

W. A. BRENNAN.

OBSTETRICS

PREGNANCY AND ITS COMPLICATIONS

Montgomery, E. E.: Recognition and Treatment of Ectopic Gestation. *Illinois M. J.*, 1916, xxix, 254.

The general practitioner should be so trained that the concurrence of sudden abdominal pain, shock, faintness, feeble pulse, and symptoms of profound anæmia will awaken the suspicion of internal hæmorrhage, and this should govern his procedure in treatment.

The physician so trained will not ply such a patient with stimulants, but rather administer a sedative, for he will remember that the vessel is open and that the only hope for relief, outside its direct control by clamp or ligature, is through the formation of a clot, whose further action increased blood-pressure would imperil.

As it cannot be assumed in any case that the clotting will be effective in the control of the hæmorrhage, the greatest certainty is through efficient closure of the bleeding vessel by its ligation, and measures should be employed to secure this under the most favorable circumstances.

Where it is not practicable to secure immediate surgical relief, the patient should be placed under the influence of morphine and kept free from annoyance until she can be placed in a proper environment for surgical measures.

Immediately preceding or simultaneously with the incision of the abdomen, active stimulation, the most efficient of which is the intravenous transfusion of saline solution to which adrenalin has been added, should be begun and continued during the operative procedure, by which any additional shock through operation is more than counteracted.

Even though it is apparent that operation is not needed to ensure against further hæmorrhage, to open the abdomen is advisable for the removal of large quantities of clotted blood, as the forces of the patient are relieved from its care and disposal.

EDWARD L. CORNELL.

Williams, J. T.: Cæsarean Section by the Modified Davis Operation. *Interst. M. J.*, 1916, xxiii, 249.

Williams has abandoned the high incision in the Davis operation because of the difficulties caused by the stomach presenting in the wound during the operation and the danger of post-operative adhesions between the stomach and the abdominal scar. He feels that the dangers of such adhesions are much greater than of those between the uterus and abdominal wall. He therefore makes an incision with its center rather than its lower end at the umbilicus. In all other respects the Davis technique is closely followed. The short incision, opening the uterus *in situ*, and the method of extracting the fœtus are all retained. The most important point in the technique is that the assistant shall draw the uterus up into the wound quickly after the extraction of the child in order to avoid soiling the peritoneum with blood and liquor. Using this technique the author has performed seventeen consecutive cæsarean sections in two years without a maternal death.

Bandler, S. W.: Some Problems in Obstetrics: Cæsarean Section; High Forceps; Pituitary Extract. *Am. J. Surg.*, 1916, xxx, 121.

The author states that by using pituitrin in proper doses and at proper intervals any uterus may be made to do the work of the best behaving, normally acting uterus. It will enable a primigravida to go through the three stages of labor within seven to ten hours. Bandler gives three to five minims as the first dose to judge the effect and follows it with one-third of an ampoule, which is repeated every half hour or so as occasion demands. When, under normal conditions with a normal presentation and a normal relationship between the head and pelvis, all that is needed is sufficient uterine force, small repeated doses of pituitary extract may be used in either the first or second stage. Three injections of a half ampoule each at half-hour intervals aid in clearing up the diagnosis of beginning parturition. Small repeated doses are also of value in supplementing the action of hydrostatic bags in the induction of labor. Bandler has used castor oil and quinine followed in a few hours by three or four doses of pituitrin with good results for the same purpose.

He divides his cases into the following classes:

1. Cases in which cæsarean section is obviously unnecessary.

2. Cases in which cæsarean section is obviously necessary.

3. Borderline cases, where the head is not engaged, or only moderately engaged. Cæsarean section done early in these cases is better than a long first and second stage terminated by a hard high forceps delivery.

4. In transverse presentation with ruptured membranes and prolapsed cord, cæsarean section, to say the least, may give a living child.

5. In eclampsia cæsarean section is advised as a general proposition.

6. Cæsarean section is recommended in all cases of placenta prævia when the child is alive and viable.

The author continues the use of pituitrin during the convalescence from cæsarean section during the first week or ten days in one-third ampoule doses every three to four hours, and gives ergotol in ad-

dition. He claims that it keeps the uterus well contracted, aids the muscular power of the intestines, and stimulates the breasts.

In conclusion Bandler states that in private practice he has not applied forceps in two years. He gave one patient thirty small hypodermatic injections of pituitrin and delivered her safely, untorn and without the aid of instruments. F. C. IRVING.

Fonyo, J.: Transperitoneal Suprasymphyseal Cæsarean Section on Account of Scariform Growth in the Vagina (Transperitonealer suprasymphysaerer erhaltender Kaiserschnitt wegen totaler narbiger Verwachsung der Vagina). *Zentralbl. f. Gynack.*, 1916, xl, No. 4.

The case reported occurred in a II-para, 24 years old, who after the first birth had suffered a complete perineal tear for which she received no treatment. The vestibule became almost entirely filled with dense, hard, scarry connective tissue with a resulting hæmatometra. The woman, however, became pregnant again and the pregnancy proceeded to term. When labor was indicated the author, having made several deep incisions (under narcosis) in the vagina, with the episcotome stretched the vagina in order to afford means for escape of the lochiæ. Following this, suprasymphyseal cervical cæsarean section was done and the child was delivered in good condition. The tubes were ligated. The case recovered normally. W. A. BRENNAN.

Adair, F. L.: Hæmorrhage Associated with Partial and Complete Detachment of the Normally Implanted Placenta. *Am. J. Surg.*, 1916, xxx, 154.

Two clinical types are recognized: one with relatively concealed hæmorrhage, the other in which the bleeding is absolutely concealed *in utero*. So far as the etiology is concerned the author speaks of two groups, the mechanical and the toxic. In the former both intra- and extra-uterine trauma may produce the hæmorrhage; in the latter any toxin which produces degenerative conditions in the maternal or fœtal placenta may be responsible for the bleeding.

Certain milder forms are relatively unimportant and cannot be diagnosed antepartum. In the more severe forms the symptoms to be kept in mind are pain, shock, and those manifestations associated with hæmorrhage.

There may be diffuse distention of the uterus or this may be localized producing the so-called accessory tumor.

Mensuration may show a progressively enlarging uterus.

The hæmoglobin estimation may show an increasingly severe anæmia.

One of the main conditions to be differentiated is placenta prævia. The chief differential point is the palpation of the placenta through the cervix uteri.

The objects to be accomplished by treatment are the maintenance of intra- and extra-uterine pressure throughout the early, rapid, and complete evacuation of the uterus through the parturient canal if the conditions are favorable, but if not cæsarean section should be performed. There should be symptomatic treatment to combat the shock and anæmia.

Wilson, K. M.: Nitrogen Metabolism During Pregnancy. *Bull. John Hopkins Hosp.*, 1915, xxvii, 121.

The nitrogen metabolism in three normal pregnancies was studied; in one patient for a period of four weeks from the tenth to the fourteenth week of pregnancy. The other two patients were studied for the last 133 and 101 days of their respective pregnancies and for a short time in the puerperal period.

A fairly liberal diet was allowed. Each article of food was weighed or measured before being given to the patient and any residue collected and again weighed or measured. The patients were kept under as normal conditions as possible in regard to exercise.

The urine was collected for twenty-four hour periods and daily analyses made. From these daily analyses the daily average nitrogen content of the urine for periods of a week at a time was estimated. Daily estimations of the ammonia nitrogen were made on all specimens and the amino-acid nitrogen was estimated for variable periods. The total nitrogen was determined by the Kjeldahl method, the ammonia by the method of Folen, and the aminonitrogen by the Van Slyke method. The fæces were preserved and analyzed weekly, and from the results obtained, the daily average nitrogen content was calculated. The patients were weighed at frequent intervals.

All three patients were perfectly normal with no nausea, vomiting, or other gastro-intestinal disturbance.

The conclusions drawn were as follows:

1. In the perfectly normal pregnant woman, storage of nitrogen begins at a much earlier period than has hitherto been supposed; possibly the organism may acquire the capacity for storing nitrogen from the very beginning of the pregnancy.

2. In the early months this storage is far in excess of the actual needs of the developing ovum, and the excess must be added to the general maternal organism.

3. Storage of nitrogen continues throughout the entire duration of pregnancy, being most marked during the last few weeks, when the fœtal needs are at a maximum.

4. The nitrogen stored is greatly in excess of the actual needs of the developing ovum, so that, apart from the amount needed for the hypertrophy and development of the genitalia and breasts, a large proportion of the nitrogen stored is added to the general maternal organism as "rest material," though concerning the form in which this reserve is stored it is impossible to make any positive statement. The nitrogen capital of the maternal organ-

ism is thus increased, though the reserve supply may possibly be entirely exhausted during the puerperium and period of lactation.

5. In the healthy woman who goes through a normal pregnancy the period of gestation does not necessarily represent a "sacrifice of the individual for the sake of the species," but may actually be a period of gain.

6. There is a relative increase in the percentage of urinary nitrogen excreted in the form of free amino-acids, though not necessarily an absolute increase in this form of nitrogen.

7. There is also a tendency for the percentage of ammonia nitrogen to become increased during the last weeks of pregnancy, although at other times during the pregnancy there is practically no variation from the percentages noted in non-pregnant individuals upon a similar diet. D. H. Boyd.

Kohlmann, W.: Fibroids Complicating Pregnancy. *South M. J.*, 1916, ix, 445.

In considering the treatment of fibroids complicating pregnancy, Kohlmann classifies the cases as follows:

1. The first class includes probably the majority of cases which are without any clinical significance and do not interfere with either pregnancy or labor. The tumor may be discovered accidentally during an examination or post-partum bleeding may lead to its discovery.

2. The second class includes cases in which the fibroid causes pronounced symptoms, which may prove dangerous to the mother and fœtus. In these cases enucleation of the tumors is advised.

3. The third class includes cases in which the location or size of the tumor or the associated displacement of the uterus make an expectant treatment extremely dangerous to mother and child, and in some cases a delivery through the natural channel is impossible. In such cases pregnancy should be allowed to go to term, but at the end of pregnancy or the beginning of labor radical treatment should be instituted. The operation of choice should be cæsarean section with supravaginal (Porro's) or total hysterectomy.

4. The fourth class includes cases in which the progress of pregnancy would increase the suffering and even endanger the life of the patient, while abortion would be very difficult and dangerous on account of the distorted uterine channel. Even after a successful termination of one pregnancy there is danger of succeeding ones. In such cases the author advises total hysteromyomectomy of the gravid uterus, or supravaginal as recommended by Landau. L. R. Goldsmith.

LABOR AND ITS COMPLICATIONS

Salisbury, W.: Three Cases of Labor Obstructed by Ovarian Cyst. *Proc. Roy. Soc. Med.*, 1916, ix, *Obst. & Gynæc. Sect.*, 21.

A case seen late in pregnancy or early labor is most safely treated by cæsarean section. Seen late in labor — especially if the uterus be infected — the safer course is to turn the uterus out of the abdomen, remove the cyst, and deliver the child per *vius naturales* before closing the abdomen. The method of induction of labor late in pregnancy followed by watchful waiting until dilatation is complete, then delivery by forceps or version plus ovariotomy, has two disadvantages: (1) the obstruction frequently leads to premature rupture of the membranes and unsatisfactory dilatation of the os; (2) the cyst may rupture before laparotomy has been performed. W. F. Hewitt.

PUERPERIUM AND ITS COMPLICATIONS

Huxley, F. M.: Fatal Rupture of the Bladder During the Puerperium. *Proc. Roy. Soc. Med.*, 1916, ix, *Obst. & Gynæc.* Sect., 24.

A primipara was delivered by forceps for persistent R. O. P., with omission of preliminary catheterization. On the ninth day the patient was attacked with severe abdominal pain, vomiting, and collapse. Post-mortem examination showed free urine in the abdomen, bladder thinned and adherent, slit 2.5 inches long at the fundus of the bladder, the edges of the slit being jagged and sharp. The rupture was probably due to pressure during delivery on the distended bladder. This pressure produced an atony of bladder musculature so that distention was not overcome. Strong abdominal contraction at the time of movement was sufficient to produce the rupture. W. F. Hewitt.

Porritt, N.: The Treatment of Puerperal Sepsis by Uterine Suction and Drainage. *Brit. M. J.*, 1916, i, 716.

The suction tube has all the advantages with none of the dangers of the uterine douche. In at least two cases the author has seen the uterine douche convert a smart sapræmia into a rapidly fatal general infection, while in another case it set up an acute, presumably chemical, peritonitis.

Three cases are reported in which the uterine contents were removed. The following instruments were used:

A glass Budin catheter, to which the inlet end of a Higginson enema syringe was attached, was passed into the uterus. To secure the syringe to the Budin catheter, the inlet valve was removed. The tube of the syringe between the bulb and the catheter was held firmly and the bulb squeezed so as to drive out the contained air through the nozzle. On releasing the pressure on the bulb, the valve behind the nozzle closed and prevented the return of the air. There was then a vacuum in the syringe, and, on releasing the pressure on the tube between the bulb and the Budin catheter, suction was exerted through the catheter within the uterus. No air was drawn into the uterus, although the suction drew into the orifices of the catheter thick, grumous, semipurulent masses which were too large to pass through and, when the catheter

was withdrawn, came with it. Reintroduction of the catheter and suction drew out more of these thick pieces.

Uterine suction discloses the condition in the interior of the uterus. It is most instructive to watch the gradual alteration of the matter withdrawn from a thick, offensive fluid, loaded with semisolid purulent masses, to a clear red liquid and from that to an inoffensive mucus. Moreover, it prevents the physician from being misled by the deceptive character of the discharge found upon the pad. The pad may be covered with discharge which may be only an overflow or may not come from the penthouse in the uterus at all, for there may be odorless discharge on the pad and foul, fœtid fluid in the uterus. Efficient drainage of the uterus is the key to successful treatment of puerperal sepsis.

Two of the three cases reported recovered.

EDWARD L. CORNELL.

Mitchell, A. G.: The Duration of the Nursing Period in Women of the United States. *J. Am. M. Ass.*, 1916, lxvi, 1690.

An analysis is presented of almost 3,000 cases taken from the records of the Children's Hospital, Philadelphia, during the last fifteen years. As it was the desire to determine, as far, as possible, the ability of the mother to nurse, many cases were excluded. It was the duration of the physiologic period of lactation, apart from disease or deliberate act of the mother, which was the problem to be solved. Thus, when the records showed that the mother stopped nursing from some such cause as going to work, or lactation was terminated by an acute infection or mammary abscess, the case was not included.

It may certainly be stated, however, that the statistics to be presented show with reasonable accuracy the length of breast feeding in the hospital class of Philadelphia women. These women are of different nationalities, including Italian, German, Russian, Armenian, Irish, and others. Many of them are native-born Americans, and a fairly large percentage consist of Jewish and colored women.

From the beginning of 1900 to the end of 1904 there were 734 cases in which the average length of lactation was 5.92 months. From the beginning of 1905 to the end of 1909 there were 827 cases with an average of 6.36 months. From the beginning of 1910 to the end of 1914 there were 1,258 cases with an average of 5.76 months; therefore, of a total of 2,819 cases during the fifteen years, the average length of lactation was 6 months.

If it is borne in mind that this is a study of the statements of the poorer class of city women, the following conclusions may be justly drawn:

1. There has been no decline in breast-feeding in the last 15 years.

2. The women of the poorer class compare favorably in the period of lactation with the women of the more prosperous class in this country.

3. The women of this country compare favorably as to the period of lactation with European women.

4. The average period of lactation in children entered at the hospital was 6 months.

5. Twenty per cent of the women did not nurse their children; 80 per cent nursed one week or longer; 55 per cent nursed three months or longer; 42 per cent nursed six months or longer; 34 per cent nursed nine months or longer; 27 per cent nursed a year or longer; 9 per cent nursed eighteen months or longer; and 2 per cent nursed two years.

6. For the reason that artificially fed babies are more susceptible to gastro-intestinal and nutritional disturbance, the infants brought to the hospital were, in the large majority of cases, bottle-fed at the time of their entrance there. The conclusion is inevitable that the figures given represent the minimum of lactation.

Table 1 shows a study of the statements of 2,819 mothers when questioned regarding the length of time their children were breast fed.

Period of Breast-feeding in Months	1900–1904 Per Cent	1905–1909 Per Cent	1910–1914 Per Cent	1900–1914 Per Cent
Not breast fed	21.117	18.256	19.713	19.695
1 week to 1 mo.	14.033	14.749	16.136	14.972
1 to 2	9.537	10.035	11.923	10.408
2 to 3	6.948	7.858	5.882	6.896
3 to 4	3.267	2.780	3.338	3.128
4 to 5	2.997	3.022	2.305	2.775
5 to 6	4.632	3.868	2.940	3.813
6 to 7	1.634	1.934	2.146	1.905
7 to 8	2.725	2.539	2.146	2.470
8 to 9	3.133	2.781	2.305	2.739
9 to 10	2.129	1.692	1.669	1.841
10 to 11	1.362	3.022	1.510	1.965
11 to 12	7.084	8.342	8.982	8.136
12 to 13	1.908	2.901	1.826	2.212
13 to 14	1.908	4.473	2.225	2.865
14 to 15	3.267	2.418	2.146	2.610
15 to 16	1.498	1.088	1.510	1.365
16 to 17	0.954	0.605	1.258	0.939
17 to 18	5.177	4.715	5.087	4.993
18 to 19	0.545	0.249	0.556	0.450
19 to 20	0.817	0.249	0.715	0.593
20 to 21	0.545	0.121	0.476	0.381
21 to 22	0.408	0.121	0.318	0.282
22 to 23	0.136	0.121	0.159	0.138
23 to 24	1.908	1.572	2.702	2.061
Over 24 months	0.272	0.487	0.397	0.385

EDWARD L. CORNELL.

MISCELLANEOUS

Gentili, A.: Histochemical Research Regarding the Function of the Decidua (Indagini istochimiche riguardante la funzione della decidua). *Ann. di ostet. e ginec.*, 1916, xxxviii, 81.

As the results of his researches on human and animal decidua Gentili finds that the decidual cells possess an essential function, the elaboration of lipoid substances belonging to the group of phosphates.

The lipoidean function is in clear and precise correlation with the cellular vitality. If these elements are defective either there is a lack of lipoid production or it passes into true fatty degeneration. The disposition of lipoids among the protoplasms and the presence of granules of this substance in the intercellular spaces indicate the method of elimination followed by the lipoids.

W. A. BRENNAN.

Ireata, D.: Analgesics in Parturition; Clinical and Experimental Contribution (Los analgesicos en el parto; contribucion clinica y experimental). *Rev. Asoc. méd.*, Argent., 1916, xxiv, 93.

The author has carried out extensive clinical investigations on parturient women, supplemented by animal experiments, in an endeavor to determine the action of morphia, pantopon, hydrate of chloral, etc., on the physiological progress of parturition.

Hysterographic methods were formerly employed, but the older apparatus in which the uterine movements were transmitted from within the uterus have been discarded in favor of external hysterography, the movements being transmitted from the abdominal wall in the region of the uterine fundus and beyond the influence of respiratory action. The transmitted movements are registered on a revolving drum.

The results as summed up by the author are as follows:

1. The toxic dose of morphine for guinea pigs may be taken as 0.0005 gr. per gram weight of the animal.

2. Hypophysary solutions do not dis-intoxicate morphine.

3. Maltose ferments not only do not dis-intoxicate morphine, but appear to increase its toxic power in animals.

4. The physiologic action of analgesics and parto-analgesics upon the arterial pressure and the uterus is equal to that of morphine.

5. The union of large doses of morphine to small doses of hypophysary extract annuls the oxytocic action.

6. Solutions of malt ferments have an oxytocic action although more ephemeral than those of the hypophysis.

7. The general opinion that pain and efforts are factors which are opposed to morphine intoxication is without foundation. The properties of morphine injected during pregnancy may be transferred without modification to the fœtal circulation. Sensibility to the toxic action of morphine is greater in the infant. Personal susceptibility toward morphine varies greatly with the subject. In 49 per cent of the cases there was not sufficient sedation of the labor pains to justify the use of large doses of morphine.

8. Products with a morphine base destined to produce analgesia are inconstant in their action, and injection of such substances during the expulsion period have little effect; moreover, their administration in cases of obstetrical intervention is not only useless but prejudicial.

9. Derivatives of opium like all analgesics do not lessen the pains of labor, but alter the uterine dynamics because they diminish the number and intensity of the contractions. Compositions with a morphine base may intoxicate without lessening labor pains.

10. Generally the dilatation and expulsion periods are prolonged in analgesized parturients. The duration of labor may be 19 hours in multiparæ and 24 hours in primiparæ. Artificial rupture of the membranes must be resorted to more frequently in analgesized women; likewise with obstetrical intervention.

11. Opium derivates, used as analgesics, intoxicate in varying degrees, 38. 5 per cent of the fœtuses, and may occasion death. Chloroform *à la Reine* is the method of obtaining an innocuous analgesia in parturition and should be used in preference to all anodynes. W. A. BRENNAN.

Regnault, I.: Choice of an Anæsthetic and General Analgesic in Surgery and in Obstetrics (Du choix d'un anésthesique et d'un "analgésique général" en chirurgie et en obstétrique). *Prog. méd.*, 1916, xliii, 59.

Regnault favors the use of chlorethylated chloroform for which he claims that analgesia appears before complete loss of consciousness and persists in the half-conscious state; moreover, there is diminution of the danger of laryngeal syncope, rapid anæsthesia almost always without excitation, considerable diminution of the quantity of chloroform necessary to maintain anæsthesia, rapid awakening, and habitual absence of vomiting. W. A. BRENNAN.

Walker, J.: The Technique at the Jewish Maternity Hospital and Its Results. *Am. J. Obst.*, N. Y., 1916, lxxiii, 429.

The author outlines the general management of patients at the Jewish Maternity Hospital, and states that they have found the following rules necessary to good results:

1. All deliveries shall be conducted on the same basis as a surgical operation: sterile draping of the patient and proper preparation, proper cleansing of the operator's hands, and the use of a sterile gown and gloves.

2. Making the smallest number of vaginal examinations, limiting oneself to one or two, and depending a good deal on external palpation for general information, and the use of rectal examination for definite information.

3. By allowing the patient to have the proper test of labor and eliminating meddlesome obstetrics.

4. The careful watching of the fœtal heart sounds and uterine contractions by an intelligent nurse, thus saving children which otherwise would be stillborn.

5. The more restricted use of pituitrin to cases in which full indications exist.

6. All cases showing a temperature above 99.3° should be regarded as suspicious, and be isolated until proved otherwise. C. H. DAVIS.

GENITO-URINARY SURGERY

ADRENAL, KIDNEY, AND URETER

Shannon, W. R.: Experimental Cloudy Swelling of the Kidney in the Rabbit. *J. Lab. & Clin. Med.*, 1916, i, 541.

Shannon defines Virchow's cloudy swelling (*truebe Schwellung*, 1858) of the kidney and quotes the opinion of others regarding albuminous granules and darkened tubulii.

Claiming that "turbidity and swelling of an organ are not always associated with increase of albuminous granules, yet, on the other hand, there may be a marked increase of albuminous granules in the cells without the presence of turbidity or swelling," an experimental study on rabbits was undertaken.

1. In the first experiment compensatory circulatory increase was produced by unilateral nephrectomy or ureteral ligation with removal of the other kidney in forty-eight hours.

2. In the second experiment chemical irritants (tartrates) were injected subcutaneously, and the kidneys were removed two to forty-eight hours thereafter.

In the third experiment, autolyzed liver solution was injected intraperitoneally. In eighteen hours one kidney was removed; the other was removed after the death of the animal.

In the fourth experiment infection was produced by injecting cultures from pasteurella abscesses. The kidneys were removed from the rabbits during the different stages of infection, thus getting the different degrees of the cloudy swelling.

The summary of the findings are as follows:

1. The normal rabbit kidney always contains, in the convoluted tubules, coarse albuminous granules. Usually these granules are so numerous in a few tubules that they appear dark in the fresh tissue. The granules are apparently thin-walled vesicles filled with fluid. They are best fixed by solutions containing formalin. They are not fixed in solutions containing acetic acid.

2. When one kidney is removed the dark tubules are increased in the opposite kidney during the first twenty-four or forty-eight hours, but the increase of albuminous granules is not sufficient to cause any definite change in the gross appearance of the kidney.

3. Subcutaneous injections of tartrates produce a swollen, cloudy kidney, but there is no increase of albuminous granules. The cloudiness and swelling are apparently due to œdema, anæmia, tissue disintegration, etc.

4. Intraperitoneal injections of autolyzed liver tissue produce a markedly cloudy and swollen kidney. The albuminous granules disappear entirely. The gross changes are apparently due to the same factors concerned in the tartrate experiments.

5. Chronic suppurative processes attended with marked emaciation cause an enormous increase of albuminous granules in the kidneys. These granules are often larger than the normal and irregular in shape, but they seem to have the same chemical composition.

6. Acute toxæmias cause a rapid disappearance of the normal albuminous granules.

7. An acute toxæmia superimposed upon a chronic suppurative process causes a disappearance of the albuminous granules.

8. Kidneys which show an enormous increase of albuminous granules usually give a normal phthalein output, and the cells are usually intact. This form of cloudy swelling is therefore probably not a degenerative change, but a physiological response to an increase of protein waste products in the blood.

9. There is no relation between the formation of albuminous granules and fatty metamorphosis.

10. It is suggested that the term cloudy swelling be discarded and that the several processes producing this appearance be considered separately.

C. E. Barnett.

Newman, D.: Pyuria, a Symptom; Its Causes and Diagnosis. *Glasgow M. J.*, 1916, lxxxv, 161.

Pyuria is a symptom of many different lesions. Pus may emanate from any point of the urinary tract, from the kidney to the urethral meatus. In every case of pyuria the important facts to determine are: the nature of the infection, the location of the lesion, and the extent of harm which has resulted from the invasion.

To discover the presence of pus in the urine is important, but to trace the cause and recognize the particular lesion producing the pyuria is necessary before any intelligent and effective treatment can be undertaken. Pyuria is nearly always due to bacterial infection. In some cases the organisms are abundant and easily found and cultivated; in others, e.g., tuberculosis and gonococcic infection, they may be hard to find and difficult or impossible to cultivate. All so-called sterile pyurias are indicative of quiescent tuberculosis.

The reaction has been considered a guide to the place from which the pus comes, acidity pointing to renal and alkalinity to vesical origin. There is no foundation for this widespread belief. The reaction in these cases depends upon the organisms present. The organisms associated with acid pyuria are bacillus coli, tubercle bacillus, streptococcus

pyogenes, pneumococcus, bacillus typhosus, and pyogenic cocci. The organisms which decompose urea and which therefore are found in alkaline urine are: staphylococcus pyogenes aureus and albus, gonococcus, and bacillus proteus. In general it may be said that of all infections of the urinary tract, in one-third of the cases the reaction is alkaline and in two-thirds acid.

Following a brief discussion of the subject the author states that as a result of experimental inquiry the following assertions may be made:

1. Simple retention of the urine does not give rise to septic inflammation.

2. Small cultures of pyogenic micro-organisms, such as staphylococcus pyogenes aureus, staphylococcus pyogenes albus, tubercle baccillus, or bacillus coli communis, when introduced into a healthy bladder fail to produce sepsis.

3. If the mucous membrane of the bladder be injured or diseased prior to the introduction of micro-organisms, sepsis immediately occurs.

4. If the artificial retention of the urine is induced from six to twenty hours after the introduction of a septic organism into the bladder, suppurative inflammation of the mucous membrane follows.

The avenues of invasion are by the blood, the lymphatics, along the lumina of the excretory ducts, and by continuity and through wounds.

The septic renal diseases are classified as follows:

1. Purulent embolic nephritis, a descending septic and suppurative lesion of the kidney, without preexisting disease of the conducting and collecting portions of the urinary tract, the septic virus being conveyed to the kidney by the blood.

2. Purulent interstitial nephritis, an ascending interstitial nephritis, infection being by the lymphatics, from a primary septic focus in the lower urinary passages.

3. Acute septic nephritis without suppuration, an ascending septic lesion of the kidney without suppuration, the virus being carried to the kidney (most commonly to the cortex) by the lymphatics.

4. Pyelonephritis, suppurative nephritis with the antecedent septic diseases of the pelvis, the secondary foci in the parenchyma of the kidney being always due to direct contamination through the uriniferous tubules and lymphatics.

5. Pyelitis, suppurative disease of the mucous membrane of the pelvis, without distention of the cavity.

6. Pyonephrosis, accumulation of pus or of purulent urine in the pelvis of the kidney, the accumulation being a result of mechanical obstruction, with atrophy of the renal tissue, but without secondary infective foci or independent accumulations of pus in the parenchyma of the organ.

In inflammation of the bladder the two most frequent sources of infection are the intestines and the urethra. Three modes of infection are enumerated:

1. Ascending infection by way of the urethra, which for obvious reasons is more common in women than in men, for example, in gonorrhœal and colon bacillus infection.

2. Descending infection, or hæmatogenous infection, where the organisms are conveyed from a primary focus to the urinary tract by the blood and are excreted by the kidney. This happens in tuberculosis, in typhoid, and in colon bacillus infections.

In addition to detecting the presence of pus in the urine, the clinician must determine the underlying causative micro-organism. Their presence is revealed by the microscope, their identity by cultivation and inoculation experiments on animals.

In the majority of cases the infection is, in the first instance, pure and becomes mixed only after instruments have been carelessly employed. The author discusses at some length the various bacteria associated with infection of the urinary tract.

In considering the presence of toxins and albumin in the urine of pyuria it is noted that most of the symptoms arise from the harmful effects of toxins which give rise to painful affections simulating lumbago, rheumatism, gall-stones, renal, and vesical calculi. These symptoms diminish or disappear on the employment of a vaccine prepared from the organism isolated from the urine, even though no effect upon the quantity of pus or number of organisms is noticeable.

In cases of marked pyuria, albumin is constant, due to the presence of pus. It has been found by observation that 100,000 pus-cells per ccm. accounts for 1 per cent of albumin, and so downward in proportion. Below 10,000 pus-cells per ccm. the urine shows only a trace of albumin unless there is some renal disease.

The author quotes Sir Lauder Brunton on the different kinds of albuminuria and by way of comment adds that the latter in his classification takes no account of those cases in which albumin is added to the urine after it has escaped from the kidneys. This "extra-renal" albuminuria is accepted by many authors. When operative interference is contemplated it is of great importance to clear up the following points:

1. Is aluminuria entirely due to pus in the urine?

2. Is the albumin derived from the kidney or from the lower urinary tract?

3. If derived from the kidney, is the albuminuria due to Bright's disease, or is it a result of other causes?

H. A. FOWLER.

Webster, J. C.: Some Observations on Pyelitis in Pregnancy. *Urol. & Cutan. Rev.*, 1916, xx, 241.

The author does not believe that pregnant women are more prone to pyelitis than those who have never been pregnant.

The following facts are indisputable as regards pyelitis in pregnancy:

1. The disease usually begins between the fifth and eighth months of gestation.

2. The colon bacillus is the infecting organism in the great majority of cases. This is also true of non-pregnant women.

3. In a majority of cases the disease occurs on the right side, though it may be bilateral or limited to the left side.

Various speculations are advanced regarding the special influences exerted by pregnancy in causing pyelitis. Although it is possible for the pregnant uterus to so mould itself as to exert direct pressure on the ureters, we have absolutely no exact knowledge as to the frequency or the degree of obstruction to the flow of urine in the ureters.

Dilatation of the ureters and renal pelvis may be found in pregnant women at autopsy or operation, but the condition may have existed prior to pregnancy. Interference with the ureters such as is produced by pelvic tumors is comparatively rarely associated with pyelitis. Moreover, in a very considerable percentage of cases of hydro-ureter no pyelitis is found. In those cases in which there is the greatest intra-abdominal pressure, e.g., primiparity, hydramnios, twin pregnancy, tumors, and pregnancy there is no greater tendency to pyelitis than in other gestation cases.

As to the greater frequency of right-sided pyelitis, without ureteral catherization no one is competent to judge whether one or both sides are affected, as pain on one side only is no proof that the other side may not be affected. Nor does the pressure of the iliac vessels explain it. Dextroversion or dextrotorsion hardly explain it either, for unless there is a very lax abdominal wall no appreciable movement of the pregnant uterus in advanced pregnancy can take place, and then it tends to fall forward when the woman is erect.

The greater mobility of the right kidney in non-pregnant women which leads to a dilatation of the renal pelvis may cause the development of pyelitis by micro-organisms. Colon bacilli are the most common organisms found in pyelitis. As to the mode of entrance of the organism the following views are held:

1. From the vulva through the urethra, bladder, and ureter, probably rare.

2. Lymphatic extension from infected bladder. This is difficult to prove and must be rare.

3. The most common source is undoubtedly the large intestine, either by direct lymphatic extension or by the blood stream.

4. Distant focal infections, especially those due to streptococci and staphylococci, may cause pyelitis by blood transmission though definite proof has not been established.

The symptoms and signs of the disease are the same as in non-pregnant women. In some cases the patient may complain only of malaise and slight fever without pain. The fever may be high and may be accompanied by chills. There is often aching in the loins. Frequently attention is first called to a pain in the affected side accompanied by fever, nausea, or vomiting. In some cases there is frequency of urination. Rarely is there actual bladder distress except where the viscus is involved. Right-sided pyelitis may simulate appendicitis or even gall-bladder disease, and serious mistakes in diagnosis may be avoided if this is borne in mind.

As to treatment: Rest in bed, soft non-irritating diet, free fluids, and urinary antiseptics are most widely employed and will suffice for a large percentage of cases. Autogenous vaccine has been disappointing. Irrigation of the kidney pelvis through the cystoscope has also been unsatisfactory.

C. C. O'Crowley.

Smith, E. O.: Diagnosis and Treatment of Renal Tuberculosis. *W. Virg. M. J.*, 1916, x, 327.

The cystoscope has demonstrated that urinary tuberculosis is usually a primary kidney lesion. It is found in 4 per cent of all autopsies, and in about 20 per cent of all autopsies made on subjects that die from tuberculosis in other organs. The miliary form is usually found in children and young adults, while the caseocavernous varieties are more common in later life.

The route of entry is by the arterial blood stream. Infection by way of the ureter where the bacilli would have to travel against the stream, and by way of the lymphatics—there are no afferent lymph-vessels to the kidney—is generally discredited. A normal kidney will excrete tubercle bacilli, but in the presence of a pathological condition of either kidney or ureter a tuberculosis focus may originate, with serious results.

Some writers believe that the glomerulus is the site of onset, while Wildbolz and Wegelin found the papillæ the most common point. Several of the author's cases showed destruction in the pyramidal areas, having apparently advanced from the papillæ and calyx. Only a small area may be involved, the remainder functioning; but the entire organ may be broken down, forming a pocket of pus and necrotic tissue. There is usually a mixed infection.

The symptoms are indefinite and cover a long period of time. Bladder symptoms are first. Frequency and pain during urination increase in direct proportion to the length of time involved. Pain in the lumbar region, unless the ureter is partially or completely blocked, the palpation of a mass, pyuria, hæmaturia, and the presence of tubercle bacilli easily found indicate an advanced condition. The onset is insidious. Intermittent hæmaturia and acid urine containing pus should be closely investigated. Guinea-pig inoculation is valuable, but it takes time. Diagnosis is made by finding tubercle bacilli in the catheterized kidney urine. Repeated examinations are usually necessary. The various general tests are not of much value in localizing a focus.

When one kidney is involved, complete removal is indicated. The ureter should be thoroughly cauterized to prevent infection of the surrounding tissue. The instillation of 10 per cent iodoform in liquid alboline or vesical irrigations of bichloride 1:8,000 to 1:15,000 will in time relieve the bladder inflammation and symptoms.

In conclusion the following points are emphasized:

1. Frequent, persistent micturition is often the earliest symptom of renal tuberculosis.

2. Intermittent renal hæmorrhage is frequently of tuberculous origin.

3. Acid urine containing pus-cells which does not culture out bacterial colonies is usually due to renal tuberculosis.

4. Many cases require repeated examinations for tubercle bacilli, even necessitating a tuberculin reaction to establish a diagnosis.

5. The earlier nephrectomy is done, the better it is for the patient. C. D. PICKRELL.

Macht, D. I.: The Pharmacology of the Ureter; Action of Drugs Affecting the Sacral Autonomics. *J. Pharmacol. & Exp. Med.*, 1916, viii, 261.

Macht has added materially to our knowledge as to the action of certain drugs on the ureter. As a result of his original investigations he reaches the following conclusions:

1. Pilocarpine, physostigmine, muscarine, pseudo muscarine, and choline, in suitable doses all stimulate the rate and force of the ureteral contractions and increase the tonus of the excised ureter. Large doses of pilocarpine may, however, secondarily paralyze that organ.

2. The pressor action of pilocarpine, physostigmine, and muscarine, is not inhibited by previous exhibition of ergotoxin.

3. Atropine in sufficient (rather large) doses inhibits the contractions and decreases the tonicity of the ureter. Small doses of atropine may produce, though not invariably, a primary stimulation of the ureteral contractions.

4. The same effects as in the ureteral preparations described by the author were noted in rabbits by observing the ureters *in situ*, after administration of pilocarpine, physostigmine, and atropine.

5. The behavior of the ureter toward the drugs studied gives pharmacological proof of its innervation by the sacral autonomics, and is also of some practical interest. H. W. E. WALTHER.

Simon, A. R., and Mertz, H. O.: The Supernumerary Ureter; Report of a Case of Complete Unilateral Duplication. *J. Am. M. Ass.*, 1916, lxvi, 1686.

The author reports a case of supernumerary ureter on the right side. The three ureteral orifices in the bladder were seen by means of the cystoscope, the extra one — a large round opening with no sphincter-like action — being low down in the substance of the trigone. Pyelograms showed that the right kidney had two separate pelves, and roentgenograms revealed the exact relative position of the two ureters on that side. These two crossed just before they entered the bladder.

Complete bilateral duplication of the ureters is rare, but supernumerary ureters on one side only are more frequent. The most common anomaly is double pelvis and ureter, with the ureters uniting before they enter the bladder.

The surgical interest in a supernumerary ureter is governed by the location of its meatus. If the opening is extravesical, surgical intervention provides the only correction. If it is of normal size and has a sphincteric action, the condition may remain latent through life. However, if the meatus is in the trigone, so that the folds of mucous membrane may close the opening, hydronephrosis is apt to result.

A supernumerary ureter with an extravesical opening is suggested by a history of constant incontinence, associated with periods of normal urination. However, this symptom does not obtain if the opening is intravesical. The anomaly can be recognized by cystoscopy unless the meatus is among the folds of the trigone or vesical neck, when chromo-ureteroscopy may be necessary. The combined use of the cystoscope and the X-ray is necessary in those cases where the two ureters are joined or have a common bladder opening. With the additional aid of the functional and bacteriologic tests, and the separate collection of urine through the catheter, every case of ureteral anomaly may be recognized clinically. W. E. LOWER.

BLADDER, URETHRA, AND PENIS

Walther, H. W. E.: Chronic Trigonitis. *Med. Rec.*, 1916, lxxxix, 853.

In local treatment for chronic trigonitis, it seems to be conceded by most writers that irrigations do little if any good. A warm irrigation, combining in solution 1:10,000 silver nitrate with 1:8,000 potassium permanganate may be used. With 1 per cent boric acid solutions distention of the bladder can be practised, using hydrostatic pressure. Cary uses a Dickinson two-way catheter for this irrigation. It is with the instillations and topical applications of silver nitrate, however, that results have been most gratifying.

By first producing anæsthesia locally in the bladder with alypin, novocaine, or eucaine, instillations of 30 to 60 minims of silver nitrate in strengths of from 0.25 to 2 per cent can be employed twice weekly. Through the Kelly cystoscope applications can be made directly to the trigone by using a 5 per cent silver solution on a cotton swab. The pure lunar caustic stick is also used in this way. Cysts on the trigone should be punctured. Diffuse hypertrophy of the papillæ in this area, when tending toward chronicity, should be curetted. These two last-mentioned procedures can be performed through an operative cystoscope in the male and through a Kelly tube in the female.

It may be found necessary, as a last resort, to do suprapubic cystotomy, thoroughly remove the pathologic process on the trigone by curettage, or otherwise apply the necessary treatment through the surgical incision and then drain the bladder, through the suprapubic wound. H. A. MOORE.

SURGERY OF THE EYE AND EAR

EYE

Arganaraz, R.: Contribution to the Study of Intra-ocular Cancer—Sarcoma of the Choroid (Contribucion al estudio del cancer intra-ocular-sarcoma coroides). *Rev. Asoc. méd.*, Argent., 1916, xxiv, 175..

In the ophthalmological service of the National Hospital of the Argentine Republic, out of 84,000 patients observed, 30 cases of uveal sarcoma were found, a percentage of 0.03 per cent. The statistical table given by Pawel gives for the various large ophthalmological clinics of the world percentages for choroid sarcoma varying from 0.03 to 0.12 per cent. It occurs as a general rule more frequently in men than in women and in the ages between 45 and 65.

Of the 30 cases referred to by the author, 3 were in the ciliary body and 22 in the choroid. In 5 cases exact location was not possible on account of the condition. The statistics of Sattler's clinic at Leipzig shows 82 per cent as choroid tumors and 8 per cent as ciliary body tumors.

With regard to the treatment it is essentially surgical, either extirpation of the tumor with preservation of the ocular globe; enucleation; or exenteration.

Extirpation with preservation of the globe is usually accomplished by iridectomy. The procedure is usually unsatisfactory as in most such interventions recurrence occurs. Enucleation is the method of election in all cases of neoplasms of the uveal tract to place the patient beyond the chance of recurrence, and intervention should be as early as possible.

When neoplastic nodules show in the superficies of the ocular globe, enucleation ought not to be considered as absolutely indicated, and in such cases it will be prudent to proceed with exenteration of the orbit. Metastases in the internal organs contra-indicate any operative intervention.

W. A. Brennan.

Jocqs and Duclos: Ocular Tuberculosis Secondary to an Industrial Accident; Clinical and Anatomic Study (Tuberculose oculaire secondaire a un accident de travail; etude clinical et anatomique). *Clin. opht.*, Par., 1916, vii, 137.

The case reported occurred in a boy of 15, who in November, 1912, was struck in the right eye by a piece of iron. The resulting ulceration was treated with iodine and the boy recovered, but a pronounced perikeratic injection and an intense photophobia persisted. By December whitish spots appeared in the cornea; the cornea was transparent, except where these spots occurred; later on yellowish granulations covered the whole surface of the iris. The eye became hypotonus without any evidences of pain.

The clinical evidence, aspect of the lesions, and complete absence of pain, suggested tuberculosis and the subsequent histological examination confirmed it. The author thinks that there are two theories to account for the pathogenesis: direct inoculation through the wound, or localization in the organ of a tuberculosis already existing in the organism. It is very difficult to choose between the two in this case.

The eye was enucleated. Histological examinations were made from different sections and these are given in detail. The authors found from these examinations that small tubercular follicles existed in the cornea; that there was a passage of granulation tissue toward the ciliary body and the base of the iris; that following the general rule lesions of tuberculous iridocyclitis remained in the territory of the anterior arterial circuit; that the structure had the same aspect as described by other authors, i.e., in the anterior zone of iris there were epithelial tubercles with lymphocyte aureole; in the posterior parts was a diffuse granulous composition of parenchymatous tubercles.

W. A. Brennan.

Huguenin, M.: Traumatic Rupture of the Ciliary Arteries (Rupture traumatique des artèries ciliares). *Clin. opht.*, Par., 1916, vii, 78.

Siegrist, in 1895, described the first case of traumatic rupture of the ciliary arteries and the fundus alterations which were consecutive. These cases are very rare. Besides Siegrist's 4 published cases, the author has found only 5 more in the literature. He now adds 2 more: one personal case, and one from Siegrist's practice. A summary is given of these 11 cases, also a bibliography. The treatment adopted generally in these cases, either subconjunctival injections or cauterization of the sclerotic, does not usually effect very great improvement in the trouble with vision which persists.

W. A. Brennan.

Fernandez, J.: Digital Compression of the Lachrymal Sac in Dacryocystitis of the Newborn Especially (La compression digital del saco lagrimal en la dacriocistitis del recien nacido especialmente). *Rev. de med. y cir.*, 1916, xxi, 141.

The author dwells on the value of massage of the sac in congenital dacryocystitis, applied continuously and by digital pressure, this being the simplest method of procedure.

Fully as satisfactory results were obtained in the newborn as in the adult. The compression

of the lacrymal sac requires manual dexterity, especially in cases of inflammations or œdemas in the proximity of the sac. In mono-ocular affections, it is best to search for the crest of the lachrymal bone and press upon it immediately, whereupon the lachrymal sac will move from that place in the fossa.

To determine the permeability of the nasal canal, the author instills a drop of fluorescin solution. He believes in Berard's teaching that, "by compression of the sac and antiseptic injections in those lachrymal parts previously dilated, one can properly treat and cure a case of dacryocystitis." As to catheterization of the nasal canal, the author considers it improper treatment; he quotes Hippel's statement that "the sounding of the nasal canal is not easy or inoffensive," and the inexperienced will make false moves which will give rise to new cicatrices.

The author describes the case of a babe, 55 days old, in whom he noticed on the fifteenth day of life a dacryocystitis and an encephaloid tumor, both of which responded equally well to compression practiced continually for several months, when the two conditions disappeared entirely.

He considers it unnecessary to recall that in the diagnosis of a dacryocystitis in general, the first thing to do is to ascertain whether the nasal canal is more or less free, so that when the dacryocystitis is relieved the tears will follow their normal course.

Another case is described of a woman suffering for two years with a subacute dacryocystitis in which compression and lavage of the sac brought about a complete cure. A year after, however, the patient having discontinued washing the sac from time to time, had another inflammation of the sac. Besides the employment of compression, the inferior lachrymal point was dilated to facilitate the egress of all accumulations in the sac.

The author considers digital compression very valuable as the initial treatment in general dacryocystitis. When the condition is so acute and painful as to prohibit its use, he advises applications of ice and abstention from making any incisions, to avoid cicatrices upon the skin of the eyelids.

RAOUL L. VIORAN.

Posey, W. C.: Tenotomy of the Inferior Oblique Muscle. *Arch. Ophth.*, 1916, xlv, 137.

Duane is quoted as giving as indications for the operation any deviation due either to actual overaction (spasm) of the inferior oblique muscle, whether primary or secondary, or a condition in which, with no actual involvement of the inferior oblique, the diplopia and symptoms are such as would be produced by spasm of that muscle.

The condition usually simulating spasm of the inferior oblique is paralysis of the superior rectus, and three conditions are given as causing true spasm or overaction of the inferior oblique secondary to paralysis of other muscles: (1) paralysis of the superior rectus when fixing with the same eye causes secondary spasm in the inferior oblique of the fellow eye; (2) paralysis of the superior oblique or some other depressor or elevator with secondary spasm of the inferior oblique in the same eye; (3) paralysis of the abducens with compensatory spasm of the inferior oblique in the same eye.

Primary spasm of the inferior oblique is regarded as very rare.

The author has operated upon 17 cases with results that were more or less satisfactory in all.

The operation consists in a curvilinear incision just superior and parallel to the lower inner bony rim of the orbit, through which muscle tendon is located with the strabismus hook, drawn forward, and divided with Stevens' scissors.

It is recommended, in children who have squinted from birth, that operation be postponed much longer than the prescribed ten years, as it has been found that in some cases the growth of the orbits and careful correction of the refractive error render the muscular deviation negligible and operation is avoided.

S. S. HOWE.

EAR

Good, R. H.: Acute Otitis Media. *Illinois M. J.*, 1916, xxix, 373.

A brief review is given of the etiology, symptoms, differential diagnosis and treatment, prophylactic, local, and general, of acute otitis media with the object of urging the general practitioner to make an early diagnosis and avoid unfortunate complications.

The author insists upon the necessity of early diagnosis before the drum membrane ruptures and serious pathological changes have taken place in the tympanum. He advises early incision of the drum membrane by an otologist under aseptic conditions and early operation in cases where mastoid symptoms supervene, together with proper general medical treatment.

ELLEN J. PATTERSON.

SURGERY OF THE NOSE, THROAT, AND MOUTH

NOSE

Lanier, L. H.: Importance of Treating Diseases of the Accessory Sinuses of the Nose. *J. Arkansas M. Soc.*, 1916, xii, 278.

In acute rhinitis and ethmoiditis, the author has had favorable results with the following medication. The nasal cavities are first irrigated freely with a mild alkaline antiseptic solution. Then the congested and swollen membranes are treated with a 4 per cent cocaine solution, applied by means of a cotton wound probe. This is followed after a few minutes by the application of a 2 per cent antipyrin solution to prolong the local anæmia produced by the cocaine. Benzoinol vapor is then applied. Bishop's coryza tablets and an acetanilide composition are prescribed, to be taken alternately as indicated. An ointment of bismuth and adrenalin is also given, to be applied to the nasal cavities three times daily.

Where the above is not sufficient, an intranasal operation consisting in removal of the anterior end of the middle turbinate and curetting the ethmoidal labyrinth is employed. After the operation is completed, the cavity is packed with a half-inch strip of sterilized gauze, saturated with sterilized benzoated vaseline. After twenty-four hours the packing is removed and the cavity gently irrigated with a warm wine-colored solution of potassium permanganate. It is then loosely packed with a half-inch strip of gauze saturated with a 10 per cent aqueous solution of ichthyol. After twenty minutes this is removed. This treatment is given once or twice daily for the first three days, after which a mild alkaline antiseptic solution is used by the patient two or three times daily. Benzoinol vapor is to be used after each irrigation. In frontal sinusitis the middle turbinate may be either infracted or resected, after which a sound is passed, followed by irrigation.

If more operative work is indicated, the uncinate process is resected and the anterior ethmoid cells curetted. If this fails, the external operation is indicated, the indications of which are thus tabulated:

1. When other forms of operation have failed.
2. The appearance of a fistula, abscesses, or necrosis.
3. When symptoms of intracranial complications appear.
4. When, during the course of a chronic frontal sinusitis, pain and fever suddenly appear and the discharge becomes fœtid.
5. When the headache referred to the eye is not influenced by intranasal procedures.
6. When the discharge remains fœtid despite frequent irrigations.
7. When the sinus inflammation gives rise to recurrent polypoid hypertrophies and polyp formations.
8. When a simple purulent discharge is not relieved by intransal measures and the patient is anxious to procure permanent relief from his annoying symptoms.

OTTO M. ROTT.

Quinlan, F. J.: Significance of Hæmorrhage in Operations on the Nose and Throat. *Med. Rec.*, 1916, lxxxix, 677.

In discussing the etiological factors of hæmorrhages in operations upon the nose and throat, the author divides them into local and constitutional.

The chief local factors, mentioned in the order of importance, are:

1. Incomplete removal of tissue due to faulty technique.
2. Local lesions of blood-vessels, particularly when the vessels are anomalously placed or when adjacent tissues are injured.
3. Local tissue anomalies such as inflammatory processes or areas of congestion. Anæsthetics contribute to this condition, general anæsthetics at the time of operation and local anæsthetics secondary to the operation.

The constitutional causes are hæmophilia, purpura hæmorrhagica, leucæmia, anæmia, and exophthalmic goiter.

The local measures mentioned for the control of post-operative nasal hæmorrhage are:

1. Pinching the alæ close together and bending the head forward in order to hold the clot in position until organized.
2. Local injections of 20 to 30 ccm. of warm liquid gelatin.
3. Yankauer's method of stitching the posterior tip of the turbinal.
4. Anterior packing.
5. Post-nasal tamponade with anterior packing.

Local measures for the control of post-operative tonsillar hæmorrhage are:

1. Absolute rest of mouth, throat, and body.
2. Digital compression by means of gauze wrapped around the finger and dipped in peroxide or antipyrine.
3. Tonsil hæmostat.
4. Bringing the tonsil pillars together by means of large metal clamps after a gauze tampon has been inserted into the fossa.
5. Suturing the pillars.
6. Constriction of the bleeding stump.
7. Ligation of the common carotid.

Other procedures are the application of precipitated blood sera in the form of serum powder, whether the bleeding be from the turbinates or the tonsil fossæ. Coagulin is also used.

The constitutional hæmostatic measures are:

1. Injection of serum, 20 to 40 ccm. If bleeding continues, the dose — 10 to 30 ccm. subcutaneously or 10 to 15 ccm. intravenously — may be repeated at intervals of 2 to 6 hours or longer.
2. Injection of pituitrin 1 ccm.
3. Calcium lactate internally. OTTO M. ROTT.

THROAT

Lack, H. L.: Partial Excision of the Thyroid Cartilage as an Alternative to Thyrotomy in Malignant Disease of the Vocal Cord. *Proc. Roy. Soc. Med.*, 1916, ix, *Laryngol. Sect.*, 62.

The larynx and trachea were exposed through the usual median incision and a Hahn cannula inserted. The right ala of the thyroid cartilage was exposed and the perichondrium detached from its lower half. The thyroid cartilage was divided in the median line, as in thyrotomy, and then the shears were turned at right angles so as to split the right ala horizontally about its center. The soft parts of the larynx were carefully divided in the median line in front, and then the incision was carried backward through the ventricle of the larynx. This aperture being held open with retractors gave a good view of the growth and it was extended through the cricothyroid membrane and the mucous membrane of the larynx well below the growth. The quadrilateral flap, consisting of the lower half of the right ala of the thyroid with the vocal cord attached, was not bent firmly outward. This gives a much better view than is presented by thyrotomy and allows greater facilities for removing the posterior part of the cord, and for arresting troublesome bleeding.

The advantages mentioned are: (1) Better access means an easier, more rapid, and more thorough operation. (2) The removal of the underlying cartilage certainly aids in thoroughness. (3) The easy control of bleeding means less trouble with the anæsthetic and less danger of blood entering the lungs. (4) Should packing of the wound be considered necessary, it is much easier to introduce it and later to remove it. It eliminates the necessity of splitting the thyrohyoid membrane and the violent pulling apart of the two halves of the thyroid which often leads to much subsequent discomfort and difficulty in swallowing. OTTO M. ROTT.

MOUTH

Eisen, E. J., and Ivy, R. H.: Roentgenologic Examination in Elimination of the Mouth as a Source of Infection in Systemic Disease. *Am. J. Roentgenol.*, 1916, iii, 269.

For the purpose of excluding infection in the mouth as a causative factor in arthritis, neuritis, etc., the author uses a very excellent routine consisting of (1) inspection, (2) response of each tooth to faradism, (3) roentgen examination, and (4) microscopic examination if pus is present.

By inspection he determines the presence of pyorrhœa, ulcerations, sinuses, swellings, or other abnormalities.

The electric examination determines the vitality of each tooth.

In making the roentgen examination he makes a plate of each side which shows the molars, cuspids, and bicuspids, in both upper and lower jaw. Small films are then made of any suspected areas, which includes all devitalized, crowned, or missing teeth.

The position used for making all the teeth on one side of the face on one plate is a very good one. The side of the face is laid against the plate, the tube being placed behind and toward the feet. The direction of the straight ray is therefore upward and forward, and enters the body beneath the angle of the opposite jaw.

The resultant picture shows the teeth of the desired side as a plane surface, with little foreshortening or magnification, and with none of the teeth on the opposite side superimposed.

In reporting his roentgenologic findings the author does not feel justified in making a definite diagnosis, but reports the condition present as normal, probably normal, probably diseased, or definitely diseased. The report embodies the results of the electric as well as the roentgen examination.

If the patient has been referred by a physician, a written report is submitted, the plates and films being retained by the roentgenologist as a record of his examination. These records are open to the inspection of the physician or any one properly authorized by him to make such inspection. They are never given to the patient to be passed upon by a third party. If the patient is referred by a dentist the plates and films are sent to him, without report, for his own interpretation. G. W. GRIER.

Darling, B. C.: Oral Sepsis as a Focus of Infection. *Am. J. Roentgenol.*, 1916, iii, 158.

This paper is made up largely of extracts from articles by Rosenow, Hartzell, Rush, Price, Broomell, Chayes, Ottolengui, and others to prove first, that oral sepsis may serve as a focus for infection leading to systemic diseases of various kinds, and, secondly, that poor dentistry is largely responsible for oral sepsis. In proof of the latter contention the author offers numerous examples in the form of specimens and roentgenograms illustrating mechanically defective crown and bridge-work, imperfect root-canal fillings, and other faulty dental operations. He maintains that the roentgenogram is practically infallible in the diagnosis of oral conditions and that the information thus obtained is an important factor in determining the proper procedures to correct the given condition.

A. HARTUNG.

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SURGERY OF THE NOSE, THROAT, AND MOUTH

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